USFilter

MEMCOR,MICROFLOC
GENERAL FILTER PRODUCTS
600 ARRASMITH TRAIL
AMES, IA 50010

TELEPHONE 515-232-4121
FACSIMILE 515-268-8500
WEBSITE www.usfilter.com

March 10, 2004

Mr. Pete Kreft
MWH Americas
111 SW 5th Avenue, Suite 1770
Portland, OR 97204

Ref: Sunrise Water Authority
North Clackamas County, OR
USF Quotation 03QC2132CMM

Dear Mr. Kraft:

Enclosed is one original of the contract for the Sunrise Water Authority Membrane Filtration System Procurement Project fully executed by U.S. Filter Wastewater Group, Inc. Also enclosed is the Performance Bond.

The Certificate of Insurance has been requested and you should receive that directly from our Surety. If you do not receive it within the next week, please let me know.

We thank you for this order and look forward to working with you on this project.

Sincerely,

U.S. Filter Wastewater Group, Inc.

Diane Bramble

Diane Bramble
Contract Administration

DMB/kkp

cc: Contract File
S DuVall/Correspondence File
C Biskner, L Uhlmeyer
B Gonzales
Bill Reilly Jr/Wm H Reilly & Assoc.

SUNRISE WATER AUTHORITY

North Clackamas County Water Commission WTP Expansion

Contract Documents for Membrane Filtration System Procurement

Request for Proposals

October 2003

MWH

Sunrise Water Authority
North Clackamas County Water Commission WTP Expansion
Membrane Filtration System Procurement

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NOTICE INVITING PROPOSALS
PROCUREMENT OF A LOW PRESSURE MEMBRANE FILTRATION SYSTEM
NORTH CLACKAMAS COUNTY WATER COMMISSION TREATMENT PLANT EXPANSION

The Sunrise Water Authority (SWA, also referred to herein as "Owner"), in conjunction with the North Clackamas County Water Commission (NCCWC), is requesting proposals for the supply and delivery of a low-pressure, immersed membrane filtration system, complete with all appurtenant equipment, pilot plant study, and related services. The proposal shall provide, at a minimum, all detailed information required in the Request for Proposals (RFP) contained herein. Proposals (5 copies including one signed original) will be received at the office of the SWA, located at 10602 SE 129th Ave., Portland, OR 97236 on **Monday, November 10, 2003** until **Noon PST**. Proposals received after this time will be returned unopened. Faxed or electronic copies of proposals will not be accepted.

It is SWA's intent to select the highest-ranked membrane filtration system supplier (hereinafter referred to as "Supplier") after review and evaluation of the proposals. As part of the proposal evaluation process, SWA may request interviews/presentations from proposers to he held at the SWA office. SWA intends to enter into negotiations with the selected Supplier prior to signing a final contract. If negotiations with the highest-ranked Supplier are unsuccessful, then SWA may elect to begin negotiations with the second-ranked Supplier.

This Request for Proposals does not obligate the Owner to accept any proposal, negotiate with any Proposer, award a Contract, or proceed with the development of any project described in response to this Request for Proposals.

Copies of the RFP are available from the Engineer (MWH Americas, Inc.), to the attention of Pete Kreft, P.E., (503) 226-7377. Detailed questions and inquiries about this RFP should be faxed to the Engineer's attention at (503) 226-0023 OR e-mailed to peter.kreft@mwhglobal.com.

1.0 PROJECT BACKGROUND

The North Clackamas County Water Commission (NCCWC) owns and operates a 10 mgd slow sand filter plant located at 14275 S. Clackamas River Drive, Oregon City, OR 97045. The Oak Lodge Water District (OLWD) and the Sunrise Water Authority (SWA) are the direct customers/owners of the NCCWC. The slow sand plant, constructed in 1998, receives untreated Clackamas River water from a screened surface water intake, pumps raw water to the slow sand filters, and then pumps filtered/chlorinated water via a 30-inch transmission pipeline under the river to the OLWD and SWA transmission/distribution systems.

Since the slow sand plant has been operational, periodic shutdowns have been required when the river's turbidity exceeds 10 NTU. During the winter of 2003, the plant was out of service for approximately 20 days due to high turbidity levels. During these shutdown periods, OLWD and SWA are required to obtain water via interties with neighboring water providers.

SWA requires additional supply for the peak-demand period of the year (normally June through September) and the additional treatment capacity shall also be capable of operating successfully throughout the year without shutdowns. Low pressure submerged membrane technology has been selected as the appropriate treatment technology for the plant expansion. The water surface elevation inside the new membrane filter basins should closely match the maximum water surface elevation inside the existing slow sand filter basins, which is approximately 3 feet above the existing ground elevation at the proposed membrane filtration building location.

Membrane-filtered water will be discharged to the existing below-ground clearwell and mixed with slow sand filtered water. A bulk sodium hypochlorite system is currently used for chlorinating the filtered water and will continue to be used for the expanded plant. Pre-chlorination of the membrane-filtered water is available for consideration if necessary/desired. As part of the plant expansion project, a new corrosion control system will be added (using either soda ash or sodium hydroxide) to adjust the filtered water pH and alkalinity.

The Clackamas River is normally a low-turbidity supply, but is subject to seasonal and periodic water quality challenges including high turbidities, tastes and odors (T&O), and algae. The membrane filtration plant will be equipped with facilities to store and feed powdered activated carbon (PAC) and alum or ACH (aluminum chlorohydrate) to ensure that the expanded plant reliably and economically provides safe and aesthetically acceptable water.

The plant site does not have access to a sanitary sewer and has an on-site septic system for sanitary wastes. Any wastes generated by the membrane filtration plant which can not be neutralized and recycled will need to be stored in an on-site waste tank and then periodically pumped and hauled off-site for disposal. The plant will not be allowed to discharge any waste streams to the Clackamas River except during emergency conditions. Solids and residuals from the membrane filtration plant will be handled with on-site lagoons or other solids handling system with liquid residuals recycled to the membrane plant influent. The supplier shall account for the recycle flow in their system design.

1.1 Clackamas River Water Quality

Various water providers, including the NCCWC, use the lower Clackamas River as their source. Table 1-1 summarizes the historical raw water quality data from September 1998 to July 2003 (at the influent to the Clackamas River Water WTP approximately 1 mile upstream of the NCCWC WTP) for temperature, turbidity, pH, alkalinity and conductivity. While no data exists on algae counts in the River, during

seasonal algae blooms, filter run lengths often are reduced by approximately 50% due to increased filter clogging and resulting headloss.

Table 1-1 Summary of Historical Clackamas River Raw Water Quality Data (1998 – 2003)

Month	Temperature (C)		Turbidity (NTU)		pH		Alkalinity (mg/L CaCO3)		Conductivity (umhos/cm)	
	Range	Ave	Range	Ave	Range	Ave	Range	Ave	Range	Ave
Jan	4.5 - 10.6	7.5	1.1 – 70.5	6.5	6.5 – 7.7	7.0	14 – 28	20	18 – 57	40
Feb	5.8 – 11.2	8.1	0.9 – 60.5	6.3	6.5 – 7.9	7.0	7 – 35	20	28 – 59	41
Mar	5.7 – 12.7	9.3	1.1 – 39.2	5.3	6.4 – 8.2	7.0	12 – 28	20	21 – 57	42
Apr	7.3 – 14.9	10.8	1.3 – 55.8	3.5	6.6 – 8.5	7.2	8 – 30	20	29 – 49	40
May	8.1 – 19.1	13.1	1.0 – 10.7	2.4	6.6 – 8.6	7.5	12 – 28	20	28 – 52	39
Jun	11.3 – 23.0	16.7	0.8 – 4.9	1.7	6.8 – 8.7	7.5	13 – 29	21	29 – 59	43
Jul	13.5 – 24.6	19.9	0.8 – 7.6	1.8	6.9 – 8.1	7.4	13 – 21	25	36 – 68	50
Aug	17.2 – 25.2	21.0	0.6 – 2.9	1.1	7.0 – 8.1	7.4	22 – 36	28	49 – 74	61
Sep	13.4 – 22.0	17.9	0.6 – 4.3	1.3	7.0 – 8.1	7.5	22 – 36	29	46 – 75	63
Oct	9.3 – 16.6	13.6	0.6 – 7.4	1.5	7.0 – 8.3	7.5	21 – 36	28	43 – 74	60
Nov	6.5 – 14.3	10.0	0.5 – 210	7.8	6.6 – 8.1	7.3	10 – 33	24	34 – 81	51
Dec	3.0 – 12.0	7.9	0.4 - 195	9.1	6.6 – 8.1	7.0	12 - 37	20	23 – 71	45

1.2 Method of Contracting and Construction

SWA will procure the membrane filtration equipment, appurtenant equipment, pilot plant study, and services per this RFP via a direct (pre-purchase) contract with the Supplier. MWH Americas Inc. will serve as the Owner's Representative and Engineer for the Supplier's contract. The General Contractor will be required to install the delivered equipment but will not be assigned the membrane filtration equipment contract with the Supplier.

SWA will procure the services of an installation and construction Contractor via a Construction Manager/General Contractor (CM/GC) approach. MWH Americas Inc. will serve as the Engineer for design and inspection services. At this time, it is estimated that the General Contractor will be under contract to SWA in early 2004.

1.3 Project Schedule

The proposed schedule for this project is identified below. It is SWA's intent to contractually commit the Supplier (via liquidated damages) to a performance and delivery schedule to meet the project completion requirements. Liquidated damages will be per Section 5.3.

Issue Requests for Proposals	October 13, 2003
Last Day for Questions by Proposers	October 31, 2003 at 4:00 pm PST
Addendum Issued (if any)	October 3, 2003 by 4:00 pm PST
Proposals Due	November 10, 2003 by Noon PST
Interviews (if requested)	November 13, 2003
Issue Notice of Intent to Award to Supplier	November 18, 2003
Workshop with Intended Supplier (Including Pilot Study Workshop)	November 20, 2003
Contract Negotiations complete	December 1, 2003
Issue Notice of Award	December 3, 2003
Issue Notice to Proceed	Upon Receipt of Performance Bond, insurance + up to 5 days

Pilot Plant Study and Reporting	December 8, 2003 through February 2004
Shop Drawing Submittal Process	December 8, 2003 through March 2004
Complete Set of Initial Submittals	no later than February 13, 2004
Shop Drawing Submittals Approved	no later than March 12, 2004
Equipment due On-Site (excluding membrane modules)	no later than October 6, 2004
Membrane modules due on-site	no later than February 2, 2005
Begin on-site construction	June 2004
Install Membrane Filtration Equipment	October 2004 through March 2005
Estimated Notice to Proceed with Membrane Filtration System Start-Up	March 22, 2005
Testing and Startup	March 22 to June 6, 2005
Plant operational	June 6, 2005

1.4 Supplier Selection Process

It is SWA's intent to select the highest-ranked membrane filtration system supplier (hereinafter referred to as "Supplier") after review and evaluation of the proposals. As part of the proposal evaluation process, SWA may elect to request interviews/presentations from proposers. Evaluation will be based on cost and non-cost factors. Submission of the lowest capital and life cycle estimated cost does not guarantee selection for procurement. The Supplier's proposal will establish the overall system performance requirements and warranties/guarantees, along with a firm cost quotation for the equipment and services to be provided and requested herein.

2.0 INSTRUCTIONS TO PROPOSERS

2.1 Preparation of Proposals

Proposals shall be prepared on the forms bound herewith (see Section 3.0) as well as in a supplementary information proposal as requested in the RFP. Partial or incomplete proposals will not be considered. Proposals shall be in strict conformity with these instructions and any addenda thereto. Proposals shall be firm for sixty (60) days from the proposal due date/time specified herein, or as it may be extended. The Proposer shall be responsible for all costs related to the preparation of the proposal. The Owner reserves the right to accept any or none of the proposals received, as deemed in the best interest of the Owner.

2.2 Proposer's Questions

Questions relative to the Request for Proposals shall be directed to the Engineer, MWH Americas Inc. to the attention of Pete Kreft, P.E. Phone 503-226-7377, Fax 503-226-0023, e-mail peter.kreft@mwhglobal.com. Questions requiring formal responses shall be e-mailed or faxed and will be accepted until October 31, 2003 at 4:00 pm. Questions submitted after this date/time may not be answered. Should the answer to a Proposer's question require a modification to the RFP, such modification will be made by issuing an addendum. It is anticipated that any required addendum will be issued no later than five (5) working days prior to the proposal due date/time.

2.3 Owner's Modification of Request for Proposals/Contract Documents

The Owner reserves the right to modify any provision or part of the Request for Proposals or the Contract Documents at any time. Before Proposals are submitted, such modifications will be in the form of addenda which will be issued to all persons who have obtained a copy of the Request for Proposals. Such addenda will become part of the Request for Proposals/Contract Documents and binding on all Proposers. The Proposer shall acknowledge the receipt of addenda in the space provided on the Proposal Forms (Section 3.0). Only written explanations, instructions or changes given by addendum will be binding on the Owner; oral explanations or instructions will not be binding on the Owner.

2.4 Proposal Security

A Proposal Security (Bid Bond or Certified or Cashier's Check) is not required.

2.5 Performance Bond

A Performance Bond is required. The bond requirements and amount are specified in Section 5.8. The cost of the bond shall be included in the Proposer's cost. The form of the required Performance Bond is included in the Appendix of this RFP. It will be transmitted with the Owner's Notice of Award for execution by the Supplier and Surety. The Proposer to whom the award is made shall furnish a satisfactory Performance Bond to the Owner within 14 calendar days from the date of receipt of the Notice of Award.

2.6 Proposal Submittal

Reference is made to Section 3.0. The Proposer shall complete (fill in) and, where indicated, execute the forms contained in Section 3. The Proposer shall also provide the additional technical information requested in Section 3.7 and supporting information as requested in Section 2.9.

2.7 Protection of Confidential Materials

Information submitted to the Owner by the Proposer is subject to possible compulsory disclosure by the Owner upon request by a member of the public. The Owner recognizes that some information which is called for in the Request for Proposals, or which may be required to be submitted in subsequent stages of the evaluation and contracting process, may be considered trade secrets or otherwise confidential by some Proposers. The Owner will protect the confidentiality of materials submitted to the extent permitted by the Oregon Public Records Act, in accordance with the procedures, and subject to the limitations described in this section.

Material which the Proposers wish to be treated in confidence and withheld from public disclosure must be clearly marked, on each page, as "CONFIDENTIAL". The Owner will not voluntarily disclose materials so marked to persons other than the Owner's officers, attorneys, employees, and consultants involved in evaluating the proposals received.

Proposers may not designate required Proposal Forms as confidential.

If the Owner receives a request from a third party to review and/or copy material so marked, it will inform the Proposer who submitted it and will allow the Proposer to present arguments and facts to the Owner in support of the position that the material is entitled to an exemption from disclosure under the Oregon Public Records Act and should not be released.

If the Owner determines that the material is not entitled to an exemption and that it must be released, the Owner will advise the Proposer of that determination prior to releasing the material so that the Proposer may seek a court order enjoining its release.

If the Owner determines that the material is entitled to an exemption, and the person who requested the information files a legal action seeking its release, the Owner will advise the Proposer and will not oppose a motion by the Proposer to intervene in the action. The Proposer must either intervene or agree to pay the Owner's legal expenses in defending the action; otherwise, the Owner will have no obligation to affirmatively defend the action and may release the information sought without any liability whatsoever to the Owner.

Material that has been marked as confidential will be returned to all unsuccessful Proposers once a contract has been signed with the selected Proposer.

2.8 Receipt and Opening of Proposals

Proposals will be accepted at the location specified until the time and date specified herein. Notification of the results of the review/evaluation of the proposals will be made at such a time as deemed appropriate by the Owner. If requested by the Owner, the Proposer shall attend an interview at the Owner's office to further clarify and explain the proposal and to respond to any questions which are asked at the interview.

The Owner reserves the right to extend by Addendum the period for submission of Proposals. If the Owner does extend the date for submission of Proposals, Proposals may be withdrawn at any time prior to the extended date.

2.9 Basis of Award

2.9.1 Total Cost. Supplier to outline system capital cost for a defined system scope of supply and provide operating and maintenance costs required to assess present worth over an established life cycle

period. Section 3 contains the forms that must be used to provide information relative to the total membrane system equipment costs and annual O&M costs.

2.9.2 Overall Experience with Proposed System. The Supplier will be evaluated based on their overall experience with the same system proposed for this project. The Supplier shall provide a complete list of the number of installations using the same membrane equipment proposed for this project. The information shall include the location, capacity, design flux rate, percent recovery, source type, pretreatment requirements, year construction completed, contact name and phone number. Evaluation will consider the Supplier's depth of experience and performance track record with other clients with similar projects.

2.9.3 Experience Treating Similar Water Quality. The Supplier shall provide a complete list of the number of installations using the same membrane equipment proposed for this project that are also treating similar raw water quality. Similar raw water quality is described as a river source water supply with generally low turbidity during most of the year but subject to turbidity spiking during storm events and periodic T&O events that require the addition of PAC. The plants treating similar raw water quality shall be identified in the table provided under 2.9.2.

2.9.4 Design Features of the System. Supplier will be evaluated on the overall quality of the operational design features of the equipment. Examples of what will be considered under this criterion include:

- features that demonstrate the reduction of risk to operators and the public through the use of membrane material, integrity testing of the membranes, water quality monitoring, cross-connection control, safety features,
- complexity of operations,
- tolerance to adjust to daily water quality changes
- level of pretreatment of the raw water required prior to membrane filtration
- number and amount of chemicals required for the operation of the membrane system.
- volume of waste (liquid) generated by the membrane system.

2.9.5 Quality of the Proposed Equipment. The Supplier will be evaluated based on the overall quality of the equipment provided and in particular, the quality of the membrane filters. Supplier to submit information specific to their membrane modules describing fiber characteristics (tensile strength and pore size), research, testing and /or certification completed to ensure equipment is capable of the sustainable production of safe drinking water. Examples of information that reflects quality of the equipment include:

- NSF Certification
- State of Oregon, Department of Health Approval for proposed membrane fiber and filtration system
- Approval in other States of the United States
- System Redundancy
- Information justifying life expectancy of membrane modules
- Reputation of equipment manufacturers (e.g. blowers, valves, pumps, etc.)
- Quality of the material (piping, supports, etc.)
- Noise
- Patents held or pending

2.9.6 Operation and Maintenance Support. Supplier to include location and extent of support services that are available to service equipment once start-up and commissioning are complete. Supplier to identify key personnel and experience that will be assigned to this project.

2.9.7 Value-Added Ideas. Proposer has the option of listing any comments, ideas and information relative to the proposed project which may be able to reduce overall project costs (capital and/or operating), increase the value and/or performance of the proposed project, or generally provide for an optimized water treatment plant.

2.9.8 Supplier Financial Stability. Supplier to provide actual certified and audited results for the past five (5) fiscal years of annual revenue, net income, total project backlog, total research and development expenditures, and annual earnings before interest and taxes. Provide current (as of November 2003) total bonding capacity.

2.9.9 Overall Scoring of the Proposals

The Proposals will be scored based on the following weighting system:

Total Present Worth Cost	30%
Quality of Equipment	30%
Experience of Supplier	20%
All Other	20%

2.10 Award of Contract

If a Contract is to be awarded, it will be awarded to the responsive, responsible Proposer submitting the best Proposal, cost and other factors considered, provided that its Proposal complies with the specified requirements; is reasonable; and is in the best interests of the Owner to accept. The right is reserved, as the interest of the Owner may require, to reject any or all Proposals and to waive the requirement for strict conformity with the specified requirements in Proposals received.

Upon issuance of the Notice of Intent to Award, the Owner may continue negotiations regarding the proposed equipment or services of the project, or the commercial and/or financial terms, with the selected Supplier prior to signing a final contract. If negotiations with the highest-ranked Supplier are unsuccessful, then SWA may elect to begin negotiations with the second-ranked Supplier.

2.11 Submission of Proposals

Five (5) copies of each Proposal (including all forms and supporting information, acknowledgement of receipt of addenda, if any). One of the five copies shall be an original signed proposal. The proposals shall be enclosed in a sealed envelope marked: "Proposal for Furnishing Submerged Membrane Filtration Equipment for the Expansion of the North Clackamas County Water Commission WTP"

and addressed to:

Mr. John Thomas, General Manager
Sunrise Water Authority
10602 SE 129th Ave.
Portland, OR 97236

The sealed envelope may be delivered in person to the Owner's office or by use of a Courier service or United States mail. Faxed or electronic copies of proposals will not be accepted.

It is the sole responsibility of the Proposer to see that its proposal is submitted in the proper form and prior to the stated closing time. The OWNER reserves the right to return any Proposal received after the specified closing time, unopened.

3.0 PROPOSAL FORMS AND SUPPLEMENTAL INFORMATION REQUIREMENTS

This section includes the proposal forms for completion and execution of the Contract as well as a description of additional information required to be provided by the proposer under separate cover and in a format chosen by the Proposer.

3.1 PROPOSAL FORM

To the Honorable Board of Directors
Sunrise Water Authority
10602 S.E. 129th Avenue
Portland, Oregon 97236

The undersigned, hereinafter called the Proposer, hereby proposes to furnish and deliver the equipment and perform the services specified for the price or prices stated and to make delivery not later than the guaranteed delivery date stated in the Schedule of Quantities and Prices.

The Proposer has carefully examined the Request for Proposals and Contract Documents, including the Instructions to Proposers, this Proposal and documents submitted together with it, General Requirements, Special Conditions, Specifications, Performance Bond Form and Purchase Contract Form, and all addenda. All provisions of the Contract Documents are hereby accepted.

The Proposer represents that it is properly licensed and adequately experienced, equipped, organized and financed to furnish and deliver the equipment specified and perform the services required.

The Proposer has carefully checked the figures entered in the Schedule of Quantities, Prices and Delivery, has carefully reviewed for accuracy all statements in this Proposal and attachments, and agrees that the Owner will not be responsible for any errors or omissions of the Proposer in preparing this Proposal. The Proposer agrees that this Proposal may not be revoked or withdrawn for sixty (60) calendar days after the date on which Proposals are received.

Contract Execution; Performance Bond

The Proposer agrees that if this Proposal is accepted it will, within fourteen (14) calendar days after having received the Notice of Award, execute and return to the Owner the Contract in the form included in the Contract Documents and will, at or before that time, deliver the Performance Bond and insurance documentation as required.

Liquidated Damages

Receipt of the membrane equipment submittals and delivery of the membrane equipment is on the critical path of the project. If the Proposer is awarded the Contract but fails to deliver a complete set of submittals by February 13, 2004; or a complete set of approved submittals by March 12, 2004; or the non-membrane equipment by October 6, 2004 or the membrane equipment by February 2, 2005 as specified in Section 1.4, Proposer agrees to pay the liquidated damages to the Owner at the rate of one thousand five hundred dollars ($1,500) per calendar day until the submittal or equipment in all respects is satisfactorily delivered.

In addition, if the Proposer is awarded the Contract but fails to satisfactorily complete the Commissioning Test within forty two (42) calendar days after the date of receipt of the Owner's second Notice to Proceed, Proposer agrees to pay the liquidated damages at the rate of one thousand five hundred dollars ($1,500) per calendar day until the Commissioning Test is in all respects, satisfactorily completed.

Addenda

The Proposer acknowledges that it has received the following Addenda No(s).:**1 and 2**; and agrees that all addenda issued are a part of the Contract Documents and have been considered in preparing this Proposal. (Proposer: insert the number of each addendum received; if no addenda were received, write "NONE" in the space).

Surety

If the Proposer is awarded the Contract, the name of the surety which will provide the Performance Bond will be Travelers Casualty and Surety Company of America
Whose address is:
c/o Marsh Risk & Insurance Services - 4695 Mac Arthur Court, #700; Newport Beach, CA 92660

The Surety is admitted in Oregon and is subject to the jurisdiction of the Oregon Insurance Commissioner.

Proposer

The name of the Proposer submitting this Proposal is USFilter Wastewater Group, Inc.

The address to which all communications concerned with this Proposal and the Contract shall be sent is (include street address) 1728 Paonia Street, Colorado Springs, Co

The Proposer's home office address, if different from above, is N/A

The Proposer's Federal Taxpayer Identification number is: 95-4328532.

Signature

1. If Sole Owner

   I sign as sole owner of the business named above as Proposer.

   _____
   Signature of Proposer

   Name:_____ Date:_____, 200_

   Business Telephone No.: (____) _____

2. If Partnership

   The undersigned certifies that he/she is a general partner in the Partnership named above as Proposer and that he/she has full authority to sign this Proposal on behalf of the Partnership.

   _____
   Signature of Partner

Signature of Partner

Name:_____ Date:_____, 200_

Business Telephone No.: (_____)_____

Address (if different from that shown above):

3. If Corporation

The undersigned certify that they are officers or authorized representatives of the Corporation named above as Proposer and have full authority to sign this Proposal on behalf of the Corporation.

US Filter Wastewater Group, Inc
Name of Corporation

By: _____ By: _____
Signature Signature

Name: Robert McCarthy Name: Deborah M. Newell
Print Print

Title: Vice President Sales Title: Vice President
Memcor Microfloc and General Filters

Date: November 11, 2003 Date: November 11, 2003

State of Incorporation:_____

Business Telephone No.: (_____)_____

(If person executing on behalf of Corporation is not the President or Vice President, attach evidence of authority to sign on behalf of Corporation.)

4. If Joint Venture

The undersigned certify that they have full authority to sign this Proposal on behalf of the Joint Venture named above as Proposer.

_____
Name of Joint Venture

By:_____ By:_____
Signature Signature

Name:_____ Name:_____
Print Print

Title:_____ Title:_____

Date:_____, 200_ Date:_____, 200_

Business Telephone No.: (_____)_____

3.2 SCHEDULE OF QUANTITIES AND PRICES

The Proposer agrees to accept as full payment for the equipment and services required, compensation as set forth below, which includes all costs for labor, materials, tools, equipment, services, all taxes (federal, state, local), insurance, bonds, permits, royalties, overhead, profit, warranty performance and all other costs necessary to perform in accordance with the Request for Proposals and Contract Documents.

Quantities and Prices

Extensions of unit prices and input values, if any, and all totals may be verified by the Owner. In the case of an inconsistency between the input value and the extension, the input value shall prevail. In the case of an error in addition or subtraction, the correct total shall prevail.

In this section, the Supplier shall provide firm quotations for the equipment and services described herein. Should the Supplier's equipment be selected for installation at the NCCWC WTP, the quotations shall serve as the basis for a Contract from the Owner. Deviations as demonstrated by the required validation pilot study in filtrate production or membrane flux rates, in recovery ratios or from the values provided in this Quotation shall not be considered justification for increases in the prices listed below.

A. Complete standard membrane filtration system including all pumps, compressors, tanks, piping, instrumentation and controls for backwashing, waste washwater holding, and chemical clean-in-place. $2,060,000.00

B. Shipping of complete system, FOB, Oregon City, OR ..... $ 45,000.00

C. Technical services during design, installation, testing/start and commissioning services, 11-month warranty inspection services and training. $230,000.00

D. Pilot Plant Validation Study, including mobilization/demobilization, equipment, materials, consumables, on-site services, and reporting $15,000.00

Total Membrane System (TMS) Cost $2,350,000.00

5-year guaranteed membrane replacement cost per module $450.00

Extended Storage of Membrane Filtration System ($per month up to six months) $12,000.00

Additive Bid Item 1. Cost (in addition to cost of item A above) of complete membrane recovery system to achieve minimum overall recovery of 99%. The recovery system shall also include all pumps, compressors, tanks, piping, instrumentation and controls for backwashing, waste washwater holding, and chemical clean-in-place $490,000.00

Additive Bid Item 2. Cost (in addition to cost of item A above) for two additional treatment trains of similar design as Item A including all pumps, compressors, tanks, piping, instrumentation and controls for backwashing, waste washwater holding, and chemical clean-in-place $1,040,000.00

3.3 STATEMENT OF EXCEPTIONS AND/OR DEVIATIONS

Proposer shall list any and all commercial and/or technical exceptions to and deviations from the specified requirements in the space provided below or in a separate section of the supplementary information provided by the proposer. Exceptions and/or deviations will be considered in evaluating proposals received. If Proposer takes no exceptions to or deviations from the specified requirements, it shall state "NONE" below.

NONE

3.4 PROPOSER'S TECHNICAL DATA

3.4.1 Membrane System Equipment

3.4.1.a Minimum System Requirements:

Section 6.0 contains a technical specification for the membrane filtration system. The primary requirements of the membrane filtration system extracted from this technical specification include the following:

- Maximum Allowable Design flux equal to or less than 80% of the Supplier's California or Washington State certified value.
- Minimum Daily Operating Recovery = 92%
- Number of Trains or Cells = four (4) initially, six (6) ultimately
- Allowance for installation of 10% additional membrane capacity in each train
- Minimum of 30 minutes retention time between backwashing cycles (non-chemical backwashes)
- Chemical washing must not occur more than once within a 24 hour period
- Chemical cleaning must not occur more than once every 30 days

The Supplier shall provide a membrane filtration system sized and configured to meet the Minimum Capacity Requirements under the range of water quality and pre-treatment conditions described in Table 3.4.1 below. The minimum capacity identified in Table 3.4.1 represents the minimum treated water delivered to the clearwell by the system in one, 24 hour period with all trains in service.

Table 3.4.1 Membrane Filtration Supplier Operating Conditions and Required Capacity

	Water Temperature		Raw Water Turbidity			Average	Max Alum	Max PAC	Min
Month	Min C	Max C	Ave (NTU)	Max 72 hr Ave (NTU)	Max 8 hr Ave (NTU)	TOC (mg/L)	Dose (mg/L)	Dose (mg/L)	Capacity (mgd)
Jan	5	10	6.5	60	80	0.9	20	0	8
Feb	6	10	6.3	70	100	1.2	20	0	8
Mar	6	13	5.3	40	75	1.0	10	0	8
Apr	7	15	3.5	40	70	0.8	10	0	8
May	8	19	2.4	15	25	0.9	5	0	8
Jun	11	23	1.7	5	20	1.1	5	0	8
Jul	15	25	1.8	5	10	1.2	5	50	10
Aug	15	25	1.1	5	10	0.7	5	50	10
Sep	15	22	1.3	5	10	0.7	5	50	10
Oct	9	17	1.5	5	15	0.9	5	0	8
Nov	7	14	7.8	140	220	1.1	20	0	8
Dec	5	12	9.1	120	235	1.5	20	0	8

Recycle Water. Waste flow from the membrane system will be diverted to a sludge lagoon or other on-site solids handling system. The supernatant of the solids handling system will be recycled to the influent of the membrane system. The recycled water is expected to meet the following criteria:

- Maximum Turbidity = 5 NTU at all times

- Recycle flow rate approximately equalized over 24 hour period (e.g. at 10 mgd treated water flow rate and 92 percent recovery, recycle flow rate equals approximately 0.8 mgd)

Pretreatment. For membrane systems that conduct a routine backwash by draining the entire train or cell, a flocculation basin with 10 minutes of hydraulic retention time will be necessary upstream of the membrane filtration system. Both alum and PAC and potentially other chemicals will be added at the inlet of the flocculation basin. The approximate cost of the flocculation basin is $120,000. For membrane systems that are designed and operated for continuous discharge of reject water (eg. Zenon 500 series), no upstream flocculation will be necessary unless otherwise recommended by the Supplier to ensure reliable performance.

Based on the monthly water quality conditions, pretreatment conditions and desired flow requirements, the supplier is to complete the following table identifying the design flux, capacity and daily recovery rate that will be expected each month. The purpose of this information is to provide additional information to the owner for determining the controlling conditions for the overall design of the system and to develop design criteria for the solids handling facilities which are separate from this contract.

Table 3.4.2 Operating Conditions (to be completed by Supplier)

Month	Max Design Flux @ Min Temperature (gfd)	Estimated Capacity @ Min Temperature (mgd)	Estimated Average Daily Recovery (%)
Jan	30	8	92.6
Feb	30	8	92.6
Mar	30	8	93.4
Apr	30	8	93.4
May	35.4	8	96.6
Jun	35.4	8	96.6
Jul	35.6	10	96.0
Aug	35.6	10	96.0
Sep	35.6	10	96.0
Oct	35.4	8	96.6
Nov	30	8	92.6
Dec	30	8	92.6

3.4.2 Membrane System Operations and Maintenance Costs

The following three (3) discrete operating conditions have been established for the sole purpose of comparing the annual operating and maintenance costs of the membrane systems. The actual system supplied must be capable of meeting the capacity requirements based on the conditions included in Table 3.4.1.

Table 3.4.3 Simulated Water Quality and Operating Conditions

Operating Condition	Percent of Year	Low Temperature (°C)	Plant Production (mgd)	Avg. Raw Water Turbidity (NTU)	Alum Dose (mg/L)
1	25%	18	8	2	0
2	25%	8	4	10	10
3	50%	13	6	5	5

Assumptions:
Capitalization Period = 6 years
Applied Discount Rate = 3%
Number of Membrane Trains/Cells = 4
Power Cost = $ 0.07/kW-hr
Operator Labor Wage = $40/hour
Chemical Disposal Costs = $0.25/gal
Wire to Water Pump Efficiency = 75%

Membrane Skid Equipment Cost and Membrane Replacement Cost Variables

Variable Name	Input Value	Variable Description and Units of Measure
TMS	$2,350,000.00	Total Membrane System Cost (Same as 3.2.A)
A	272.3	Membrane Surface Area per Cartridge or Submodule (ft^2)
B	288	Number of Membrane Cartridges or Sub-modules per Train or Cell[1]
C	$400,000.00	Cost per Membrane Train or Cell ($)
D	$450	Cost per Individual Membrane Cartridge or Sub-module for Replacement Purposes ($)
E	5	Guaranteed Membrane Cartridge or Sub-module Operation Life for Replacement Purposes
F1	96.6%	Guaranteed Minimum Feedwater Recovery Conditions 1 (as fraction)[2]
F2	94.2%	Guaranteed Minimum Feedwater Recovery Condition 2 (as fraction)[2]
F3	95.4%	Guaranteed Minimum Feedwater Recovery Condition 3 (as fraction)[2]

[1] Membrane cartridge or sub-module defined as bundle of hollow-fibers housed in individual unit.

[2] Membrane recovery defined on a daily basis as: permeate production minus backwash water divided by feedwater use.

Cost Calculation for Membrane Skids and Membrane Replacement:

Equipment Cost of Membrane Skids:

K1 = TRAIN/CELL COST = 4 * C = **$ 1,600,000.00**

Equipment Cost of Ancillary Equipment (not including skids):

K2 = ANCILLARY EQUIPMENT COST = TMS-K1 = **$ 750,000.00**

Single Full Plant Membrane Replacement Cost:

L = REPLACEMENT COST = 4 * B * D = **$ 518,400.00**

Annual Cost of Membrane Replacement:

M = ANNUAL REPLACEMENT COST = $0.03 * L * \frac{1.03^E}{(1.03^E - 1)}$ = **$ 113,195.00**

Present Worth of 6 years Membrane Replacement:

N = PRESENT WORTH MEMBRANE REPLACEMENT = 5.42 * M = **$ 613,199.00**

Cost Calculation for Present Worth of Annual Power and Cleaning: Membrane Operational Variables

Variable Name	Input Value	Variable Description and Units of Measure
P1	28.4	Maximum Operating TMP[2] at 18°C (feet of H_2O).
P2	28.4	Maximum Operating TMP[2] at 8°C (feet of H_2O).
P3	28.4	Maximum Operating TMP[2] at 13°C (feet of H_2O).
Q	5	Required Minimum Permeate Backpressure (feet of H_2O)
T1	2.03	Estimated Daily Electrical Load for Backwash at Recovery F1 (kW-hrs per mgd)
T2	5.3	Estimated Daily Electrical Load for Backwash at Recovery F2 (kW-hrs per mgd)
T3	2.7	Estimated Daily Electrical Load for Backwash at Recovery F3 (kW-hrs per mgd)
U	16.3	Baseline Electrical Load for Miscellaneous System Operations (e.g. air blowers), (kW-hrs per mgd)
V	0	Fraction of Feedwater Consumed by Feedwater Bleed (as applicable)
W	8	Guaranteed Maximum Number of Chemical Cleanings per Year
Y	0	Guaranteed Price of Proprietary Chemicals for Cleaning per Skid per Clean ($)
Z	3,660	Volume Chemical Cleaning Solution per Skid per Clean[1] (gallons)

[1]If Supplier is neutralizing and recycling chemicals, this value should be zero

Transmembrane pressure represents headloss between the water level in the tank and the minimum permeate backpressure.

Annual Power Cost of Pumping:

For Operating Condition 1:

$$AA1 = [\text{illegible}] * \frac{8\ \text{MGD}}{0.75 * \text{F1}} * 0.175 * 0.7457 * \frac{25}{100} * 24\ \text{hrs} * 365\ \text{days} * \$0.07$$

= $ 7,378.00

For Operating Condition 2:

$$AA2 = [\text{illegible}] * \frac{4\ \text{MGD}}{0.75 * \text{F2}} * 0.175 * 0.7457 * \frac{25}{100} * 24\ \text{hrs} * 365\ \text{days} * \$0.07$$

= $ 3,783.00

For Operating Condition 3:

$$AA3 = [\text{illegible}] * \frac{6\ \text{MGD}}{0.75 * \text{F3}} * 0.175 * 0.7457 * \frac{50}{100} * 24\ \text{hrs} * 365\ \text{days} * \$0.07$$

= $11,195.00

Total Annual Pumping Costs

AA4 = AA1 + AA2 + AA3 = $ 22,356.00

Annual Power Cost for Backwashing:

For Operating Condition 1:

$$CC1 = T1 * \frac{8\ \text{MGD}}{0.75} * \frac{25\%}{100} * 365\ \text{days} * \$0.07$$

= $138.00

For Operating Condition 2:

$$CC2 = T2 * \frac{4\ \text{MGD}}{0.75} * \frac{25\%}{100} * 365\ \text{days} * \$0.07$$

= $ 181.00

For Operating Condition 3:

$$CC3 = T3 * \frac{6\ \text{MGD}}{0.75} * \frac{50\%}{100} * 365\ \text{days} * \$0.07$$

= $ 276.00

Total Annual Power Costs for Backwashing:

CC4 = CC1 + CC2 + CC3 = $ 594.00

Annual Power Cost for Baseline Electrical Load:

For Operating Condition 1:

$$DD1 = U * \frac{8\ MGD}{0.75} * \frac{25\%}{100} * 365\ days * \$0.07$$

= $ 1,111.00

For Operating Condition 2:

$$DD2 = U * \frac{4\ MGD}{0.75} * \frac{25\%}{100} * 365\ days * \$0.07$$

= $ 555.00

For Operating Condition 3:

$$DD3 = U * \frac{6\ MGD}{0.75} * \frac{50\%}{100} * 365\ days * \$0.07$$

= $ 1,667.00

Total Annual Power Cost for Baseline Electrical Load:

DD4 = DD1 + DD2 + DD3

= **$ 3,333.00**

Annual Cost for Chemical Cleaning Labor and Disposal:

EE Annual Cleaning Cost = W * 4 * [Y + ($40/hour * 4 hrs) + (Z * $0.25/gal)]

= **$ 34,399.00**

Total Annual Operational Power and Cleaning Costs:

FF = AA4 + CC4 + DD4 + EE

= **$ 60,681.00**

Present Worth of Annual Operations Cost:

GG Present Worth Operations = FF * 5.42

= **$ 328,722.00**

TOTAL MEMBRANE FILTRATION SYSTEM O&M PRESENT WORTH:

Present Worth of Membrane Filtration Plant = N + GG

= **$ 941,922.00**

3.5 Chemical Washing and Cleaning Information

Proposer to complete the information requested in the following table regarding the chemical washing and chemical cleaning of the membrane filtration equipment. The value placed in the table, where appropriate, represents the annual average value based on the operational conditions listed in Table 3.4.3. For the purposes of this table, a skid refers to a complete train or cell.

Parameter	Units	Value
Chemical Wash Interval	**days**	**1.43**
Total Time each Membrane Skid is Off-line per Chemical Wash	min	30
Chemical Wash On-line Factor	%	98.6%
Volume of Permeate for Chemical Solution Make-up per Wash per Skid	gal	3,660
Volume of Permeate for Rinsing per Wash per Skid	gal	1,157
Total Volume of Permeate per Skid per Chemical Wash	gal	4,817
Volume of Feedwater per Skid per Chemical Wash	gal	1,943
Total Volume of Waste Solution per Skid per Chemical Wash	gal	6,761
Total Volume of Permeate Required for Chemical Washing	gal	10,105
Total Volume of Feedwater Lost during Chemical Washing	gal	4,076
Total Volume of Wastewater Generated during Chemical Washing	gal	14,182
Chemical Wash Chemical #1		**Phosp. Ac**
Molecular Weight	g/mol	98
Percentage of all Chemical Washes Using this Chemical	%	47.8
Concentration for Chemical Washing	mg/L	250
Concentration as Delivered (100% if solid used)	% (w/w)	85%
Specific Gravity as Delivered Solution	-	1.685
Quantity of Chemical required per Chemical Wash per Skid	lbs	7.6
Percentage of Active Chemical consumed by the Chemical Wash	%	25
Neutralization Chemical #1		**Caustic**
Molecular Weight	g/mol	40
Molar Ratio of Neutralization		1.22
Concentration as Delivered (100% if solid used)	% (w/w)	50
Specific Gravity as Delivered Solution	-	1.52
Quantity of Neutralization Chemical required to neutralize the Waste Chemical from Chemically Washing one (1) Skid	lbs	7
Chemical Wash Chemical #2		**Sodium Hypo.**
Molecular Weight	g/mol	74.5
Percentage of all Chemical Washes Using this Chemical	%	52.1
Concentration for Chemical Washing	mg/L	50
Concentration as Delivered (100% if solid used)	% (w/w)	12.5
Specific Gravity as Delivered Solution	-	1.196
Quantity of Chemical required per Chemical Wash per Skid	lbs	1.5
Percentage of Active Chemical consumed by the Chemical Wash	%	25
Neutralization Chemical #2		**Sodium Bisulf**
Molecular Weight	g/mol	104
Molar Ratio of Neutralization		1.47

Concentration as Delivered (100% if solid used)	% (w/w)	40
Specific Gravity as Delivered Solution	-	1.345
Quantity of Neutralization Chemical required to neutralize the Waste Chemical from Chemically Washing one (1) Skid	lbs	1.7
Chemical Wash Chemical #3		N/A
Molecular Weight	g/mol	N/A
Percentage of all Chemical Washes Using this Chemical	%	N/A
Concentration for Chemical Washing	mg/L	N/A
Concentration as Delivered (100% if solid used)	% (w/w)	N/A
Specific Gravity as Delivered Solution	-	N/A
Quantity of Chemical required per Chemical Wash per Skid	lbs	N/A
Percentage of Active Chemical consumed by the Chemical Wash	%	N/A
Neutralization Chemical #3		N/A
Molecular Weight	g/mol	N/A
Molar Ratio of Neutralization		N/A
Concentration as Delivered (100% if solid used)	% (w/w)	N/A
Specific Gravity as Delivered Solution	-	N/A
Quantity of Neutralization Chemical required to neutralize the Waste Chemical from Chemically Washing one (1) Skid	lbs	N/A
Chemical Wash Chemical #4		N/A
Molecular Weight	g/mol	N/A
Percentage of all Chemical Washes Using this Chemical	%	N/A
Concentration for Chemical Washing	mg/L	N/A
Concentration as Delivered (100% if solid used)	% (w/w)	N/A
Specific Gravity as Delivered Solution	-	N/A
Quantity of Chemical required per Chemical Wash per Skid	lbs	N/A
Percentage of Active Chemical consumed by the Chemical Wash	%	N/A
Neutralization Chemical #4		N/A
Molecular Weight	g/mol	N/A
Molar Ratio of Neutralization		N/A
Concentration as Delivered (100% if solid used)	% (w/w)	N/A
Specific Gravity as Delivered Solution	-	
Quantity of Neutralization Chemical required to neutralize the Waste Chemical from Chemically Washing one (1) Skid	lbs	N/A
Chemical Cleaning Interval		
Cleaning Chemical #1		Phosphoric Ac.
Chemical Cleaning Interval	days	55
Total Time each Membrane Skid is Off-line per Chemical Clean	min	125
Chemical Clean On-line Factor	%	99.84
Number of Chemical Cleans per year	#	19.9
Volume of Permeate for Chemical Solution Make-up per Clean per Skid	gal	3,660
Volume of Permeate for Rinsing per Clean per Skid	gal	1,871
Total Volume of Permeate per Skid per Chemical Clean	gal	5,530
Volume of Feedwater per Skid per Chemical Clean	gal	3,887

Total Volume of Waste Solution per Skid per Chemical Clean	gal	9,417
Molecular Weight	g/mol	98
Percentage of all Chemical Cleaning Using this Chemical	%	100
Concentration for Chemical Cleaning	mg/L	5,000
Concentration as Delivered (100% if solid used)	% (w/w)	85
Specific Gravity as Delivered Solution	-	1.685
Quantity of Chemical required per Chemical Cleaning per Skid	lbs	153
Percentage of Active Chemical consumed by the Chemical Clean	%	25
Neutralization Cleaning Chemical #1		Caustic
Molecular Weight	g/mol	40
Molar Ratio of Neutralization		1.22
Concentration as Delivered (100% if solid used)	% (w/w)	50
Specific Gravity as Delivered Solution	-	1.52
Quantity of Neutralization Chemical required to neutralize the Waste Chemical from Chemically Cleaning one (1) Skid	lbs	140
Cleaning Chemical #2		Sodium Hypo
Chemical Cleaning Interval	days	55
Total Time each Membrane Skid is Off-line per Chemical Clean	min	125
Chemical Clean On-line Factor	%	99.84
Number of Chemical Cleans per year	#	19.9
Volume of Permeate for Chemical Solution Make-up per Clean per Skid	gal	3,660
Volume of Permeate for Rinsing per Clean per Skid	gal	1,871
Total Volume of Permeate per Skid per Chemical Clean	gal	5,530
Volume of Feedwater per Skid per Chemical Clean	gal	3,887
Total Volume of Waste Solution per Skid per Chemical Clean	gal	9,417
Molecular Weight	g/mol	74.5
Percentage of all Chemical Cleaning Using this Chemical	%	100
Concentration for Chemical Cleaning	mg/L	200
Concentration as Delivered (100% if solid used)	% (w/w)	12.5
Specific Gravity as Delivered Solution	-	1.195
Quantity of Chemical required per Chemical Cleaning per Skid	lbs	6.1
Percentage of Active Chemical consumed by the Chemical Clean	%	25
Neutralization Cleaning Chemical #2		Sodium Bisulf.
Molecular Weight	g/mol	104
Molar Ratio of Neutralization		1.47
Concentration as Delivered (100% if solid used)	% (w/w)	40
Specific Gravity as Delivered Solution	-	1.345
Quantity of Neutralization Chemical required to neutralize the Waste Chemical from Chemically Cleaning one (1) Skid	lbs	6.8
Cleaning Chemical #3		N/A
Chemical Cleaning Interval	days	N/A
Total Time each Membrane Skid is Off-line per Chemical Clean	min	N/A
Chemical Clean On-line Factor	%	N/A
Number of Chemical Cleans per year	#	N/A
Volume of Permeate for Chemical Solution Make-up per Clean per Skid	gal	N/A

Volume of Permeate for Rinsing per Clean per Skid	gal	N/A
Total Volume of Permeate per Skid per Chemical Clean	gal	N/A
Volume of Feedwater per Skid per Chemical Clean	gal	N/A
Total Volume of Waste Solution per Skid per Chemical Clean	gal	N/A
Molecular Weight	g/mol	N/A
Percentage of all Chemical Cleaning Using this Chemical	%	N/A
Concentration for Chemical Cleaning	mg/L	N/A
Concentration as Delivered (100% if solid used)	% (w/w)	N/A
Specific Gravity as Delivered Solution	-	N/A
Quantity of Chemical required per Chemical Cleaning per Skid	lbs	N/A
Percentage of Active Chemical consumed by the Chemical Clean	%	N/A
Neutralization Cleaning Chemical #3		N/A
Molecular Weight	g/mol	N/A
Molar Ratio of Neutralization		N/A
Concentration as Delivered (100% if solid used)	% (w/w)	N/A
Specific Gravity as Delivered Solution	-	N/A
Quantity of Neutralization Chemical required to neutralize the Waste Chemical from Chemically Cleaning one (1) Skid	lbs	N/A
Cleaning Chemical #4		N/A
Chemical Cleaning Interval	days	N/A
Total Time each Membrane Skid is Off-line per Chemical Clean	min	N/A
Chemical Clean On-line Factor	%	N/A
Number of Chemical Cleans per year	#	N/A
Volume of Permeate for Chemical Solution Make-up per Clean per Skid	gal	N/A
Volume of Permeate for Rinsing per Clean per Skid	gal	N/A
Total Volume of Permeate per Skid per Chemical Clean	gal	N/A
Volume of Feedwater per Skid per Chemical Clean	gal	N/A
Total Volume of Waste Solution per Skid per Chemical Clean	gal	N/A
Molecular Weight	g/mol	N/A
Percentage of all Chemical Cleaning Using this Chemical	%	N/A
Concentration for Chemical Cleaning	mg/L	N/A
Concentration as Delivered (100% if solid used)	% (w/w)	N/A
Specific Gravity as Delivered Solution	-	N/A
Quantity of Chemical required per Chemical Cleaning per Skid	lbs	N/A
Percentage of Active Chemical consumed by the Chemical Clean	%	N/A
Neutralization Cleaning Chemical #4		N/A
Molecular Weight	g/mol	N/A
Molar Ratio of Neutralization		N/A
Concentration as Delivered (100% if solid used)	% (w/w)	N/A
Specific Gravity as Delivered Solution	-	N/A
Quantity of Neutralization Chemical required to neutralize the Waste Chemical from Chemically Cleaning one (1) Skid	lbs	N/A

3.6 Guaranteed Membrane Life

Proposer to provide the minimum guaranteed life as defined in Section 5.9.B of each membrane module in the space below. The minimum guaranteed life must be between 5 and 10 years. This information will be included in the evaluation of proposals.

Guaranteed Membrane Life = 7 (seven) Years

3.7 Additional Technical Requirements of Proposal

3.7.1 General Membrane Filtration System Data

A. Membrane Filtration System Assembly Details and Dimensions. Drawings shall show the layout of the membrane system as a whole, arrangement of the skids, pumps, piping, valves and other ancillary equipment, and space requirements for installation and maintenance of all equipment. Drawings shall explicitly note the recommended interior building dimensions for the Membrane Filtration System including the building width, length and height. The equipment and building layout shall account for the future addition of two additional trains/cells to increase the plant capacity by 50%.

B. Piping and Instrumentation Diagrams. The diagrams shall delineate the scope of materials supplied and shall include information about interfaces between Supplier-provided and Owner-supplied components.

C. Information on the proposed membrane modules, including model no., materials of construction, dimensional information, module configuration, supplied number of modules per skid and capacity of modules per skid.

D. Preliminary single line diagrams.

E. Hydraulic calculations through the membrane system, including documentation of the worst case hydraulic head loss through the membrane system, i.e. just before a chemical cleaning, for the purposes of evaluating the required sizing of feedwater pumps.

F. Furnish evidence that the proposed membrane filtration system has received full water treatment process certification from the Oregon Department of Human Services (ODHS). If the Proposer's equipment has not been certified in Oregon, provide evidence of certification and conditions of certification in all other states in which the equipment is State-certified for potable water use.

3.7.2 Membrane Filtration System Components Data

A. A detailed list (including manufacturers and model numbers) of all major equipment components including membrane modules, skids, pumps, air movers, on-line analytical instruments, strainers, valves and any other equipment to be provided as part of the system that draws an electrical or pneumatic load. Design criteria for each component shall be included and include motor sizes, electrical loads drawn by the equipment (including power in kilowatts, voltage, current, phase, etc.).

B. Performance curves for pumps, blowers, compressors and vacuum pumps, plus details of the type of drive included (fixed or variable speed).

3.7.3 Membrane Filtration Operation and Maintenance Data

A. Description of how the membrane system automatically detects a membrane integrity problem and the procedures required to locate and to repair a compromised membrane fiber or element (include details of any special tools required to locate or repair a compromised membrane fiber or element, as well as the estimated labor hours and skill level required to accomplish the entire procedure). Include the expected number of such events per year.

B. Description of the operation of the system in all normal operating cycles, including on-line mode, backwashing, and chemical cleaning. The process description shall also include projections of reject production rates for the purposes of evaluating residuals handling requirements for the plant.

C. Estimated labor requirements (in person hours) for the membrane systems for one year of operation and maintenance of the system.

D. Description of process water to be used for chemical cleaning with table of required range of water quality for significant water quality parameters. If additional treatment to permeate is required for preparation of chemical cleaning solutions, include a description of the necessary water quality and proposed treatment system.

E. A description of the instrumentation and controls strategy.

3.7.4 Pilot Study

A. Pilot unit plans and sections including dimensions

B. Connection points for all utilities including location, size and connection type

C. Feed water flow requirements

D. Location and total power requirements

3.8 Schedule

A. The Proposer shall submit its schedule for completing the pilot plant study, submittals, and for fabricating and delivering the equipment with its Proposal. The activities and milestones to be scheduled are shown in the Proposed Schedule in Section 1.4. The Proposer shall indicate the expected duration of each activity and the date of each milestone. The Proposer is welcome to offer earlier completion dates than required in Section 1.4.

OFFICER'S CERTIFICATE

The undersigned, Vice President and Assistant Secretary of U.S. Filter Wastewater Group, Inc. ("Corporation"), hereby certifies that Robert McCarthy is duly authorized to execute and deliver the proposal for the North Clackamas County Water Commission Water Treatment Plant Expansion, Membrane Filtration System Procurement Project, on behalf of the Memcor, Microfloc and General Filter Products Group of U.S. Filter Wastewater Group, Inc., together with all associated documentation.

IN WITNESS WHEREOF, I have hereunto set my hand this 10th day of November, 2003.

Deborah M. Newell
Vice President and Assistant Secretary

4.0 GENERAL REQUIREMENTS

4.1 WORDS AND PHRASES/DEFINITIONS

4.1.1 Words and Phrases

Where the words "required," "approved," "satisfactory," "suitable," "determined," "acceptable" or words of like import are used in the Contract Documents, action by the Authority is indicated unless the context clearly indicates otherwise. Such action, or failure to act, shall not relieve the Supplier of its responsibilities to perform the work in accordance with the requirements of the Contract.

Working titles with a masculine gender such as "workman" and "journeyman" and the pronoun "he," if used, are intended to refer to persons of either sex.

4.1.2 Definitions

Addendum. A written change by the Authority in the Contract Documents issued prior to the opening of Proposals.

Agreement. See definition of "Contract"

Authority, The. The Sunrise Water Authority, also referred to as "Owner".

Bidder. See Proposer

Board of Directors. The governing body of the Authority.

Consequential Impact. The indirect, non-speculative and unanticipated effect of any Authority-caused change in the Work on the Supplier's operations. The mere fact that there has been a change in the Work caused by the Authority does not mean that there has been Consequential Impact to the Supplier.

Contract. The written agreement made and executed by and between Authority and Supplier setting forth the agreed upon terms and conditions governing the Work. The Contract contains a list of the documents incorporated into and made a part thereof. Contract change orders, if any, become a part of the Contract.

Contract Change Order. A written order issued by Authority covering changes within the scope of the Contract Work (work modification order) or work performed outside the scope of the Contract Work (scope change order).

Contract Documents. Contract Documents are those documents listed in the Contract.

Contractor. The contracting organization (individual or individuals, firm, partnership, corporation, joint venture or combination thereof), acting as an independent contractor in performing work, which has entered into a written Contract with Authority. Also referred to as "Seller" and "Supplier."

Days. Calendar days, unless otherwise stated

Equipment. The equipment, materials and supplies to be furnished.

Proposal. The offer of the Proposer for the Work

Proposer. Any individual, firm, partnership, corporation, joint venture or combination thereof submitting a Proposal of Work.

Supplier. Any individual, firm, partnership, corporation, joint venture or combination thereof under contract to provide the membrane filtration system and associated appurtenances and services.

Subcontractor. A contracting organization (individual or individuals, firm, partnership, corporation, joint venture or combination thereof) which enters into a subcontract to perform work for the Supplier.

Work. The furnishing of the "Equipment" as defined in the Specifications and the fulfillment of all requirements specified in the Contract Documents including insurance during transportation, the performance bond and all services including design, delivery, inspection, testing, field service engineering, and installation assistance specified or required to furnish the Equipment.

Satisfactory, Satisfactorily. Work performed and completed as required by the Contract Documents.

4.2 PRICE; TAXES

The Authority is exempt from Federal excise tax; exemption certificates will be furnished upon request.

4.3 CHANGES, ADJUSTMENT, TERMINATION

Authority may, by written change order, make any changes, including additions to or deletions from the quantities originally ordered, or in the specifications or drawings. If any such change affects the amount due or the time or performance hereunder, an equitable adjustment shall be made. Authority may, at any time, by written change order, terminate this Agreement as to all or any portion of the Equipment then not shipped, subject to an equitable adjustment as to any work in progress with respect to any Equipment which are Supplier's standard stock. No such termination shall relieve Authority or Supplier of any of their obligations as to any Equipment delivered. Any claim for adjustment hereunder must be asserted within thirty (30) calendar days from the date when the change or termination is ordered. Authority shall arrange for pickup of any equipment and materials not yet delivered within thirty (30) calendar days after order of termination.

4.4 DELAYS; TIME EXTENSIONS

4.4.1 Delays: The Supplier will not be held responsible for unavoidable delays in completion of the work caused by reasons beyond its control. No time extensions will be given for avoidable delays. Avoidable delays in the prosecution or completion of the work shall include all delays which might have been avoided by the exercise of care, prudence, foresight or diligence on the part of the Supplier. Delays in the prosecution of parts of the work, which may in themselves be unavoidable but do not necessarily prevent or delay the prosecution of other parts of the work nor the completion of the whole work within the time herein specified, reasonable loss of time resulting from the necessity of submitting shop drawings to the Authority for review and from the making of surveys, measurements and inspections, and by such interruptions as may occur in the prosecution of the work on account of the reasonable interference of other contractors employed by the Authority which do not necessarily prevent the completion of the whole work within the time herein specified, will be considered by the Authority as avoidable delays within the meaning of this contract.

4.4.2 Unavoidable delays shall include the following:

a. Acts of God

b. Acts of foreign, domestic, Federal or State governments

c. Federal Government orders or contracts required by law to have priority over this contract

d. Strikes

e. Unusual failure to interstate transportation

f. War and inability to obtain materials due to war

g. Insurrection or riot

h. Abnormal weather conditions

i. Fires

j. Floods

k. Epidemics

4.4.3 Claims for Extensions of time shall be submitted by the Supplier in writing to the Authority within fifteen (15) days of the cause of the delay.

4.4.4 Time is of the essence of this Agreement.

4.5 NO WAIVER

Failure of Authority to insist upon strict performance of any of the terms and conditions hereof, or failure to exercise rights or remedies available to Authority by reason of this Agreement or provided by lay, or failure to give Supplier notification of breach; or receipt and acceptance of the Equipment; or approval of the design of the Equipment or payment for the Equipment or any part of them shall not relieve Supplier of its obligations and warranties and shall not be deemed a waiver by Authority of its right to insist upon strict performance of this Agreement or of any of Authority's rights or remedies provided by law.

4.6 DELIVERY CHARGES

If the price quoted includes a charge for delivery from point of origin, Supplier shall show such delivery charge on the invoice as a separate item.

4.7 INSPECTION

Authority shall have the right to inspect the Equipment at any time during manufacture and prior to shipment, as well as after delivery, installation and testing. The Equipment shall not be deemed accepted until after the final inspection at the conclusion of on-site Commissioning testing. The making or failure to make any inspection of, payment for or acceptance of the equipment shall in no way impair Authority's right to reject nonconforming equipment, or to avail itself of any other remedies to which the Authority may be entitled, notwithstanding Authority's knowledge of the nonconformity, its substantiality or the ease of its discovery. Supplier's scheduling of purchases and fabrication; issuing of

suborders; monitoring of status and progress of work and the work of its suppliers; and the fabricating and assembling of the Equipment are subject to onsite review, inspection and comment by the Authority or its representatives. Authority's personnel shall be allowed reasonable access to Supplier's plants, and those of its suppliers, for such purposes. As required by Authority, Supplier shall supply schedules and progress reports for Authority's use.

4.8 COMPLIANCE WITH LAWS

Supplier warrants that all Equipment sold hereunder shall have been produced and sold in compliance with all applicable Federal and State laws and local ordinances.

The Supplier's price and schedule shall be based on applicable Federal and State laws, local ordinances, codes, and standards in effect as of the date of Supplier's proposal. Should such laws, codes, and standards change and increase the cost of performing the work or impact the schedule, Supplier shall, upon notice to Authority of such, be entitled to an equitable adjustment of price and/or schedule. Similarly, should such lays, codes, and standards change and decrease the cost of performing the work, Authority shall be entitled to an equitable adjustment of price.

Unless stated otherwise, the Authority will obtain any permits or other regulatory approvals required for system installation. Supplier shall obtain any permits required for delivery of the Membrane Filtration Equipment. Where references are made to licenses, the Supplier shall possess a license only to the extent a license is actually required.

4.9 TRANSFER OF TITLE AND RISK

Title to the Equipment transfers on acceptance as defined in 5.8.

Supplier shall bear the risk of loss or damage to the Equipment through satisfactory completion of the delivery to either the NCCWC WTP or other location selected by the Authority. Supplier shall also bear the risk of loss or damage to the Equipment during any extended storage period as specified in Section 5.10.4.

The Authority will require its Installation Contractor to purchase and maintain property insurance in an amount of $3,000,000 through the period of the NCCWC WTP Expansion construction contract. The Installation Contractor's insurance will:

- Include the interests of the Authority and the Proposer, each of whom is deemed to have and insurable interest in the Equipment;
- Be written on a Builder's Risk "all-risk" or open peril or special causes of loss policy form that shall at least include insurance for physical loss and damage to the Equipment and shall insure against at least the following perils or causes of loss: fire, lightning, extended coverage, theft, vandalism, and malicious mischief, earthquake, collapse, debris removal, demolition occasioned by enforcement of Laws and Regulations, and storm or flood damage;
- Include expenses incurred in the repair or replacement of any insured property to the extent necessitated by such perils or causes of loss; and
- Cover portions of the Equipment stored at the NCCWC WTP or at another location that was agreed to by the Authority and its Installation Contractor prior to being incorporated in the Construction.

4.10 INDEMNITY

Supplier shall indemnify, defend and hold harmless Authority and its directors, officers, employees and agents against all claims, costs, losses and damages arising out of or resulting from Supplier's performance of the Work, provided that such claim, cost, loss or damage is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself) by only to the extent that such claim, cost, loss or damage is caused in whole or in part by negligent act or omission or breach of contract by Supplier.

4.11 PATENT INFRINGEMENT

Supplier shall, at its own expense, indemnify, defend and hold harmless the Authority against any claim, suit or proceeding brought against the Authority which is based upon a claim, whether rightful or otherwise, that the Equipment, or any part thereof, constitute an infringement of any patent, and Supplier shall pay damages and costs awarded against the Authority. In case said equipment, or any part thereof, in such suit is held to constitute infringement, and the use of said equipment or part is enjoined, the Supplier shall, at its own expense, and at its option, either procure for the Authority the right to continue using said equipment or part; or replace the equipment with noninfringing equipment which the Authority has determined to be substantially equal; or modify the equipment so it becomes noninfringing and continues to be equivalent to the originally furnished equipment as determined by the Authority.

4.12 SUPPLIER-FURNISHED DRAWINGS AND SPECIFICATIONS

4.12.1 General

The Authority shall own Drawings and Specifications furnished by Supplier. Authority may make and retain copies for information and reference in connection with the use of the project by Authority and others. Any reuse without written verification or adaptation by Supplier of Drawings and Specifications will be at Authority's sole risk and without liability or legal exposure to Supplier and Authority shall indemnify and hold harmless Supplier from all claims, damages, losses and expenses including attorneys' fees arising out of or resulting therefrom. Any such verification or adaptation will entitle Supplier to further compensation at rates to be agreed upon by Authority and Supplier.

Required printed copies of shop drawings and O&M Manuals submitted by the Supplier shall be determinative of Supplier's work product. Any electronic versions of shop drawings and O&M Manuals required to be submitted by the Supplier are not required to be "guaranteed" as defined in Section 6.

4.12.2 Proprietary Information

Information submitted to the Authority by Supplier is subject to possible compulsory disclosure by the Authority upon request from a member of the public. The Authority recognizes that some information which may be required to be submitted during the course of the Work may be considered trade secrets or otherwise confidential by Supplier. The Authority will protect the confidentiality of materials submitted to its to the extent permitted by the Oregon Public Records Act, in accordance with the procedures, and subject to the limitations described in this section.

Material which Supplier wishes to be treated in confidence and withheld from public disclosures must be clearly marked, on each page, as "CONFIDENTIAL." The Authority will not voluntarily disclose materials so marked to persons other than the Authority's officers, agents, employees, and contractors involved in the Work or in subsequent maintenance and repair of the Work.

If the Authority receives a request from a third party to review and/or copy material so marked, it will inform the Supplier and will allow the Supplier to present arguments and facts to the Authority in support of the position that the material is entitled to an exemption from disclosure under the Oregon Public Records Act and should not be released.

If the Authority determines that the material is not entitled to an exemption and that it must be released, the Authority will advise the Supplier of the determination prior to releasing the material so that the Supplier may seek a court order enjoining its release.

If the Authority determines that the material is entitled to an exemption, and the person who requested the information files a legal action against the Authority seeking its release, the Authority will advise the Supplier and will not oppose a motion by the Supplier to intervene the action. The Supplier must either intervene or agree to pay the Authority's legal expenses in defending the action; otherwise the Authority will have no obligation to affirmatively defend the action and may release the information sought without any liability whatsoever. In any event, Supplier will reimburse Authority for any attorneys' fees which it incurs or which it is ordered to pay to a third party by a court of competent jurisdiction.

4.13 WARRANTY

Supplier warrants that all materials furnished (1) shall meet all requirements of the Contract Documents, and (2) shall be free from defects in design, materials, and workmanship. EXCEPT FOR THE EXPRESS WARRANTIES STATED HEREIN, SUPPLIER DISCLAIMS ALL WARRANTIES WITH RESPECT TO THE GOODS, INCLUDING ANY AND ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE.

If the Authority mandates changes that impact the Supplier's ability to meet certain warranty obligations, the Supplier shall notify the Authority in writing of the warranty obligations impacted prior to implementing the mandated changes. The Authority may then choose to either 1) excuse the Supplier from the impacted warranty obligations or 2) withdraw the mandated changes. If the Supplier fails to notify the Authority as required, all warranty obligations shall remain in full force and effect.

4.14 NO ASSIGNMENT

Supplier shall not assign this Agreement or any interest therein, or subcontract or delegate any duties hereunder without the prior written consent of the Authority, except for subcontracts disclosed in Supplier's Proposal.

4.15 INDEPENDENT CONTRACTOR

Supplier, and any agents and employees of Supplier, in the performance of this Agreement shall act in an independent capacity and not as officers, employees or agents of Authority.

4.16 NOTICE OF POTENTIAL CLAIM

The Supplier shall not be entitled to the payment of any additional compensation or damages for any cause, including any act or failure to act by the Authority, or the happening of any event, thing or occurrence, unless it gives the Authority written notice of potential claim as described below.

The written notice of potential claim shall set forth the reasons for which the Supplier believes additional compensation or damages will or may be due, the nature of the cost involved and, insofar as possible, the amount of the potential claim. The notice must be given to the Authority prior to the time that the

Supplier performs the work giving rise to the potential claim for additional compensation or damages, if based on an act or failure to act by the Authority, or in all other cases, within fifteen days after the happening of the event, thing or occurrence giving rise to the potential claim. If the event giving rise to the potential claim is not apparent to Supplier, despite Supplier's exercise of due diligence, the time for giving notice of potential claim shall be extended until 15 calendar days after the potential entitlement to a claim is, or should be, apparent to Supplier.

It is the intention of this section that differences between the parties arising under and by virtue of the Agreement be brought to the attention of the Authority at the earliest possible time in order that such matters may be settled, if possible, or other appropriate action promptly taken. The Supplier agrees that it shall have no right to additional compensation or damages for any claim that may be based on any such act, failure to act, event, thing or occurrence for which written notice of potential claim was not given as required in this section.

4.17 LIQUIDATED DAMAGES

It is agreed that time is of the essence of this Agreement, and in the event of delay in completion of the work or the delivery of the supplies, materials or equipment beyond the date set forth in the Contract Documents, or beyond authorized extensions thereof, damage will be sustained by the Authority and that it is or will be impracticable to determine the actual amount of the damage by reason of such delay, and it is therefore agreed that the Authority shall be paid an amount as set forth in the Special Conditions as liquidated damages.

4.18 WARRANTY OF TITLE

Supplier warrants to the Authority that the title to the material, supplies or equipment, when delivered to the Authority, shall be free from all liens and encumbrances.

4.19 BINDING ON SUCCESSORS

The provisions of this Agreement shall be binding upon and inure to the benefit of the successors and permitted assigns of the parties.

4.20 PAYMENTS

4.20.1 Determination of Contract Earnings

Measurements and computations to determine quantities of work to be paid shall be made by the Supplier by the method or methods specified in the Special Conditions. If the method or methods are not specified, measurements and computations shall be made by the Supplier by such methods as the Authority may consider appropriate for the class of work measured.

For lump sums items in the Payment Item Schedule or effective work modification orders or scope change orders, payments will be made on the basis of the payment schedule as specified in the Special Conditions, or if not specified, by a method that the Authority may consider appropriate.

For unit price items in the Payment Item Schedule, or effective work modification orders or scope change orders, payment will be made as specified in the Special Conditions, or if not specified, by a method that the Authority may consider appropriate.

From the amount of the contract earnings determine as specified in this article, the Authority will make deductions determined as specified in 4.20.2.

4.20.2 Determination

From the amount of contract earnings determined as specified in 4.20.1 the Authority will make the following deductions:

A. Liquidated damages for late completion.

B. Amounts due the Authority for supplies, material, services and/or damages.

C. Amounts due the Authority as provided for elsewhere in the Contract Documents.

The monthly progress payment will be the contract earnings less the amount of deductions.

4.20.3 Payment

Progress payments for uncontested items will be made no later than 30 days following receipt of invoice from supplier.

4.20.4 Interest on Late Payment

A. Should the Authority fail to make any progress payment within 30 days after receipt of an undisputed and properly submitted payment request from the Supplier, then the Authority will pay interest to the Supplier equivalent to the United States Treasury Prime Interest Rate plus one (1%) percent per annum.

B. Upon receipt of a payment request, the Authority shall act in accordance with both of the following:

1. Each payment request will be reviewed by the Authority as soon as practicable after receipt for the purpose of determining that the payment request is a proper payment request.

2. Any payment request determined not to be a proper payment request suitable for payment will be returned to the Supplier as soon as practicable, but not later than seven days, after receipt. A request returned pursuant to this article will be accompanied by a document setting forth in writing the reasons why the payment request is not proper.

C. The number of days available to the Authority to make a payment without incurring interest pursuant to this article shall be reduced by the number of days by which the Authority exceeds the seven-day return requirement set forth in 4.20.4.B.2.

D. For purposes of this article:

1. A "progress payment" includes all payments due the Supplier.

2. A payment request shall be considered properly executed if funds are available for payment of the payment request, and payment is not delayed due to an audit inquiry by the financial officer of the Authority.

4.21 CONSEQUENTIAL DAMAGES/LIMITS OF LIABILITY

A. The maximum amount of Contractor's liability in damages for breach of contract provisions related to time of performance or for breach or warranty shall be ten percent (10%) of the contract amount for the Total Membrane System.

B. The maximum amount of Contractor's (and Contractor's directors, officers, employees and agents) liability in the aggregate to Authority and anyone claiming by, through or under Authority, for any and all injuries, claims, losses, expenses or damages whatsoever arising out of or in any way related to Contractor's services, the project, the work or this agreement from any cause or causes whatsoever, including but not limited to the negligence, errors, omissions, strict liability, tort, breach of contract or breach or warranty (except for causes described in subsection A of this section which are subject to a separate, lower limit) shall not exceed one hundred fifty percent (150%) of the contract amount for the Total Membrane System. By way of clarification, proceeds paid by Contractor's insurer to Authority or for Authority's account shall count toward this aggregate limit on liability. Notwithstanding the generality of the foregoing, the above limit shall not apply to claims for personal injury or property damage made by third parties directly against Contractor.

C. Contractor shall have no liability to Authority for consequential damages. Consequential damages shall be defined as purely economic damages such as lost revenues. Notwithstanding the generality of the foregoing, monies expended to cause the filtration system to meet the express warranties provided hereunder shall not be deemed consequential damages. In addition, damages for personal injury or property damage shall not be deemed consequential damages.

5.0 SPECIAL CONDITIONS

All parts of the Contract are intended to be complementary and any work required by one and not mentioned by another shall be performed to the same extent as thought required by all. In the event there are any inconsistencies or discrepancies between provisions contained in the General Requirements, the Special Conditions and the Specifications, the Special Conditions and Specifications shall govern over the General Conditions.

5.1 Description of the Equipment and Work to be Done

5.1.1 Description of the equipment

The equipment consists of the following principal elements:

Project schedule and updates as required by the Owner.

Conduct and Reporting of a Pilot Plant Study as specified in Section 7.0

Complete Membrane Filtration System including all modules, components and subsystems specified in Section 6.0.

All required information, drawings, manuals, etc. required by these Contract Documents.

5.1.2 Work to be Done

The work to be done consists of the following principal elements:

A. Select the Supplier-furnished components required for satisfactory system operation.

Design the equipment.

Plan for, conduct and report on a pilot plant study to be used to confirm the design of the equipment

Prepare outline and detail drawings for fabrication and/or manufacture of the equipment.

Order materials and subassemblies.

Attend meetings with the Owner and Engineer to coordinate the design of the overall membrane treatment facility.

Fabricate, manufacture and assemble the equipment.

Inspect and test all equipment before delivery.

Prepare installation instructions and operating manuals.

Deliver the equipment (excluding membrane modules)

Furnish the services of field service technicians for installation assistance

Deliver the membrane modules.

Furnish services of field service technicians for start up assistance

Satisfactorily complete the Commissioning Test.

Provide training to Owner's operations staff

Furnish services of field service technicians for the 11-month warranty testing.

5.2 Commencement, Completion and Prosecution of the Work

5.2.1 Commencement and Completion

Reference is made to 4.4 DELAYS AND 5.3 LIQUIDATED DAMAGES.

The Owner will issue two (2) separate Notices to Proceed.

The Owner's initial Notice to Proceed will not be issued until a satisfactory Performance Bond has been received by the Owner. There will be no day-to-day extension of the delivery date on the account of any delay in the issuance of the Owner's initial Notice to Proceed due to an unsatisfactory bond received. The initial Notice to Proceed will be issued within five (5) working days of the Owner's receipt of a satisfactory Performance Bond.

The second Notice to Proceed will be entitled "Notice to Proceed with Membrane Filtration System Start-up" and will be issued upon the completion of the installation (performed by others) of the Membrane Filtration System equipment (excluding membrane modules) and all other related structures, pumps, piping, electrical equipment, etc. shown on the Supplier's submitted Piping and Instrumentation Diagram(s) as necessary for operation of the Membrane Filtration System. The second Notice to Proceed will be issued no later than six (6) calendar months after satisfactory delivery of all equipment. Reference is made to Section 4.3. The Supplier may submit a claim for costs incurred as a result of delays exceeding the specified six (6) calendar month period due to delays beyond the control of the Supplier.

Time is of the essence. Completion of the various parts of the work shall be as specified below

ITEM	NO LATER THAN
A1. Delivery of the Submittals	February 14, 2004
A2. Delivery of the Equipment (Excluding Membrane Modules)	October 6, 2004
A3. Delivery of the Membrane Modules	February 2, 2005
B. Satisfactorily Completion of the Commissioning Test	Seventy six (76) calendar days after the date of receipt by the Supplier of the Authority's "Notice to Proceed with Membrane Filtration System Start-up"

In event that the final day of any period of calendar days stated above falls on a Saturday, Sunday or national holiday, the end of the period shall be extended to the next subsequent business day.

The Supplier shall submit to the Owner written notice for all delays (including delays which occur prior to the specified allowance for delays beyond the control of the Supplier is fully utilized).

5.2.2 Prosecution

The Supplier shall furnish sufficient forces, plant and equipment, and shall work such hours, including extra shifts and overtime operations, and shall furnish such other necessaries as may be require to complete the various parts of the work within the time specified.

5.3 Liquidated Damages

5.3.1 Liquidated Damages for Late Completion

Supplier shall complete specified portions of the work, if any, and all the work under the Contract Documents within the time or times specified in the Proposal and Special Conditions.

It is agreed by the parties that in case all the work called for under the Contract Documents in all parts and requirements or a specified portion of the work us not completed within the time specified in the Proposal and Special Conditions, the Owner will suffer damage, the amount in which is impracticable and extremely difficult, if not impossible, to ascertain and determine. Therefore, the Owner will be entitled to liquidated damages in the amount or amounts specified in the Special Conditions per day for each and every day's delay in finishing the work or specified portion if the work in excess of the time or times specified. The Supplier and its surety or sureties agree to pay said liquidated damages herein provided for, and further agree that Owner may deduct the amount thereof from any monies due or that may become due Supplier under the Contract Documents. It is further agreed that the sum or sums set forth in the Special Conditions are the best estimate of damage Authority will actually suffer if completion of the work or specified portion if the work provided for in this Contract is not timely achieved by Supplier. Further, the Supplier has reviewed said estimate and concurs that it is the best estimate of damage available at the time this Contract is executed.

The amount of liquidated damages shall be as follows:

Failure to satisfactorily complete delivery of the required submittals by the date specified in Section 5.2.1, Item A1: $1,500 per calendar day.

Failure to satisfactorily complete delivery of the Equipment (excluding membrane modules) by the date specified in Section 5.2.1, Item A2: $1,500 per calendar day.

Failure to satisfactorily complete delivery of the Membrane Modules by the date specified in Section 5.2.1, Item A3: $1,500 per calendar day.

Failure to satisfactorily complete Commissioning Test by the date specified in Section 5.2.1, Item B: $1,500 per calendar day.

Reference is made to Section 4.4. Liquidated damages shall not be payable where Supplier's failure to make the scheduled date(s) is due to circumstance not the fault of, and beyond the reasonable control of, Supplier. Liquidated damages shall only be imposed with respect to Supplier's failure to satisfactorily deliver the Membrane Filtration System or failure to satisfactorily complete the Commissioning Test.

5.4 Schedule Updates

The Supplier shall update its Project Schedule monthly, if requested by the Owner.

5.5 Delivery

Delivery of the equipment shall be made to the North Clackamas County Water Commission Water Treatment Plant Site, which is located at 14275 S. Clackamas River Drive, Oregon City, OR 97045.

Supplier shall notify the Project Engineer named in Section 2.2 at least 72 hours before delivery is scheduled. Unloading shall be done by the Owner's Installation Contractor. All deliveries shall be made on regular Owner workdays during normal hours. The carrier will be unloaded within four hours of arrival except for deliveries arriving after 3:00 p.m., which will be unloaded the following Owner workday.

The Owner or its representative may inspect the equipment during unloading. Any equipment which is discovered to be damaged will be repaired or replaced by Supplier at no additional expense to the Owner.

The Owner reserves the right to redirect the delivery of this equipment or any other portion of the equipment to another site within the County. Any redirection will be made in writing or a fax. All other specified delivery requirements remain in effect unchanged.

5.6 Start-up and Commissioning Test

5.6.1 Purpose

The purpose of the start-up period is to allow the Supplier to install the membrane modules and other components it elects to install and to test, operate and optimize the Membrane Filtration System prior to the Commissioning Test. The purpose of the Commissioning Test is to confirm that the Membrane Filtration System can perform within specifications during a specified operational period. The start-up period and satisfactorily completion of the Commissioning Test shall be completed within the time period specified in Section 5.2.1B.

Satisfactorily completion of the Commissioning Test is required for the Authority to accept the Membrane Filtration System.

Additional testing requirements are specified in Section 6, Part 4, Testing.

5.6.2 Commissioning Test Prerequisites

Reference is made to Section 5.2 COMMENCEMENT, COMPLETION, AND PROSECUTION OF THE WORK. Prior to issuing "Notice to Proceed with Membrane Filtration System Start-up," the Owner will perform start-up and optimization of any pretreatment and flow control process(es) upstream of the Membrane Filtration System so that the Owner will be able to consistently provide Membrane Filtration System feedwater meeting the approximate guidelines for temperature, turbidity, pH range and volume as defined in Section 3.4. The Owner will provide a minimum of seven (7) calendar days advance notice to the Supplier prior to issuing the "Notice to Proceed with Membrane Filtration System Start-up."

After receipt of the Owner's "Notice to Proceed with Membrane Filtration System Start-up," the Supplier shall complete the following Commissioning test prerequisite items prior to performing the Commissioning Test:

Confirm that the Owner's Installation Contractor has satisfactorily completed installation of all Supplier-furnished components not otherwise specified to be installed by the Supplier.

Installation of membrane modules.

Flushing, testing and calibration, as applicable, of all Supplier-furnished Membrane Filtration System components and subsystems. Supplier shall calibrate all Supplier-furnished instruments shown on the Membrane Filtration System piping and instrumentation drawings to appropriate standards of the National Institute of Standards and Technology (NIST). Supplier shall furnish calibration reports to the Owner. Supplier shall provide Owner with a complete schedule for calibration of Membrane Filtration System components. The Owner personnel may be present to observe the Supplier's calibration work.

Installation and testing of all required software.

Operation and optimization of the Membrane Filtration System.

Assure itself that all requirements necessary to satisfactorily complete the Commissioning Test have been met (including chemically cleaning membranes with either citric acid or chlorine or other chemicals, if desired by the Supplier).

Notify the Owner that all of the Commissioning Test prerequisites are complete.

Arrange a mutually agreeable date to begin the Commissioning Test with the Owner (Commissioning test will begin within two workdays of the Supplier's notification). Although not required, the Supplier is encouraged to invite representatives of all the manufacturers of Supplier-furnished equipment to witness the Commissioning Test.

Not used.

Arrange for sufficient Supplier personnel to be at the site to adjust and calibrate all components required during the Commissioning Test.

Perform required services specified in Section 6, Part 3.02A.

Perform an integrity test on all of the stages before the start of the performance test as described in the operating manual. Record the number of membrane modules operating with both permeate valves open on each stage.

Prior to performing the Commissioning Test, the Owner will correct any deficiencies (noted by the Supplier) in the installation of Supplier-furnished components not otherwise specified or elected by the Supplier to be installed by the Supplier.

5.6.3 Commissioning Test Procedure

Raw water with the appropriate addition of coagulants or PAC, depending on raw water quality conditions at the time of testing, will be used as feedwater during the Commissioning Test. The membrane modules shall be chemically cleaned prior to initiation of the Commissioning Test.

The test will consist of the following elements:

Based on feedwater temperature, turbidity and pH, the Owner will determine the appropriate Operating Condition as specified in Section 3.4. The Owner will then operate feedwater pumps and manipulate valves to provide the Supplier with either 8 or 10 mgd, as appropriate for that Operating Condition.

The Owner and Supplier will perform tests to confirm all equipment shown on the Supplier's P&ID and electrical drawings is functioning properly and continuously during the Commissioning Test.

5.6.4 Satisfactory Completion of Commissioning Test

The Commissioning Test will be satisfactorily completed when the Membrane Filtration System has met all of the following performance requirements concurrently for a continuous period of operation of 168 hours:

Membrane Filtration System shall continuously produce permeate that meets the production requirements for the appropriate operating condition.

Membrane Filtration System shall satisfactorily pass all integrity tests.

All components and systems contained within the Membrane Filtration System shall continuously function as required.

Membrane Filtration System shall meet the Supplier's stated performance criteria in Section 3.4.3 for Guaranteed Maximum Operating Clean-Membrane Transmembrane Pressure (TMP), and Guaranteed Maximum Volume of Backwash Water.

5.6.5 Termination of Commissioning Test

The Commissioning Test will be terminated under the following conditions:

The membrane Filtration System does not meet performance requirements.

The feedwater does not meet the specified flow rate.

Membrane Filtration System fails integrity testing.

If the feedwater temperature changes over the period of the Commissioning Test to such an extent to cause a change in the Operating Condition, the Membrane Filtration System performance requirements will be changed to reflect the appropriate new Operating Condition.

Commissioning Test terminations due to malfunctions in Supplier-furnished equipment or other issues directly related to the furnished Membrane Filtration System shall necessitate a complete repeat of the Commissioning Test at no additional expense to the Owner.

One repeat of the Commissioning Test shall be performed at no additional expense to the Owner if the Commissioning Test is terminated for one or more of the following reasons:

Malfunctions in Owner-furnished equipment required for the satisfactory operation of the Membrane Filtration System.

The Owner orders the test terminated for reasons of its own convenience.

If additional repeats of the Commissioning Test are required to be performed for any of the reasons listed above, the cost of the additional tests will be paid by the Owner.

If additional repeats of the Commissioning Test are required to be performed for any reason other than the three listed above, the cost will be paid for by the Supplier.

5.7 Trade Names

Items designated by a trade name are unique or are required to match similar existing equipment used elsewhere by the Authority.

5.8 Acceptance and Warranties

The warranties provided in Sections 4.13 and 5.9 shall commence on the date of acceptance of the Equipment by the Owner (which shall occur when the Owner's Board of Directors formally accepts the equipment) and shall continue in force and effect for a period of twelve (12) months or 24 months after delivery, whichever occurs first. Acceptance shall occur at the first Board meeting following satisfactory completion of the Commissioning Test. The Owner's Board meets two times per month and such meetings are typically held on the first Tuesday and third Monday of each month.

If the Membrane Filtration System is non-operational due to repairs or replacements during the warranty period, the warranty period shall automatically be extended for a period of time equal to the number of calendar days that the Membrane Filtration System is non-operational due to such repairs or replacements. If at any time during the warranty period the Owner determines that the equipment or its component parts fail to satisfy the terms of the warranty, the Owner shall notify the Supplier and the Supplier shall promptly repair or replace the equipment or its component parts and a new 12 month warranty shall commence for the replaced or repaired component upon the date the Owner accepts said replaced or repaired component. Notwithstanding the generality of the foregoing, the warranty period extension obligations shall not apply to the membrane modules and the gasket seal interfaces between the membrane modules and the membrane filtration piping (which are subject to separate express warranties) and normal consumables and wear items (such as pipe flange gaskets and pump seals). The Owner's notice to the Supplier to repair, replace or restore any defects or damage pursuant to this warranty shall be timely if given not later than ten (10) days subsequent to the expiration of the warranty period provided. The Supplier shall assume all costs and expenses associated with such repair or replacement work, including any and all costs for shipment and for any and all costs incurred to arrange consultants to evaluate the defect and or damage and to advise on the proper repair. Supplier shall not be obligated to repair or replace Membrane Filtration System components whose failure to meet the terms of the warranty is shown to have been caused by 1) operation of the Membrane Filtration System not in accordance with specified operating conditions; 2) operation of the Membrane Filtration System not in accordance with Supplier-furnished operating and maintenance instructions; or, 3) repair or modification of the Membrane Filtration System by the Owner both not in conformance with Supplier-furnished operating and maintenance instructions and without Supplier's prior written approval. Supplier may witness the operation of the goods to verify operating conditions.

If the Supplier shall fail to repair, replace or restore such defects within ten (10) calendar days after receiving such notice, the Owner shall have the right to have the work done by others and recover the cost from Supplier or its sureties under the performance bond. If the amount of such bond is insufficient to cover the cost of such work, the Supplier shall be liable to pay such deficiency on demand by the Owner. The Owner's records setting forth the fair and reasonable cost of repairing, replacing or restoring any damage or defects when performed by one other than the Supplier shall be binding and conclusive as to the amount owed by the Supplier.

The Performance Bond (Bond for Faithful Performance) shall be so conditioned to insure the faithful performance by Supplier of all covenants and conditions of the Contract Documents and the replacing of or making acceptable, any defective materials or faulty workmanship occurring within the warranty periods specified. The initial amount of this bond shall be 100 percent (100%) of the amount of the award as stated in the Owner's Notice of Award. This bond shall remain in full force and effect until the

Equipment is accepted by the Owner. Upon acceptance of the Equipment by the Owner, this bond shall be maintained in force at 50 percent (50%) of the amount of the award as stated in the Owner's Notice of Award for the duration of Guaranteed Membrane Performance warranty period. The performance bond will be returned to the Supplier within 30 days after the expiration of the Guaranteed Membrane Performance warranty period provided that the Owner does not have a claim for performance pending at that time.

5.9 Performance Warranties

The Supplier shall warrant the performance of the Equipment as specified below:

Guaranteed Membrane Performance: The Supplier shall guarantee that the actual Maximum Operating Clean-Membrane Transmembrane Pressure (TMP), and Guaranteed Maximum Volume of Backwash Water per Day will be within 8% of the stated membrane system performance parameters for each of the Operating Conditions for the period of time specified in Section 5.8.

In the event that the operating requirements have been met but the membrane system fails to meet its performance obligations, Supplier may request permission from the Owner to implement any reasonable modifications to the Membrane Filtration System to meet the operating requirements including the addition of membrane area, replacement of defective components, modification of the membrane system design, or other means at no additional cost to the Owner. The Owner will not unreasonably withhold permission to make such modifications.

Guaranteed Membrane Module Operational Life: The Supplier shall guarantee the membrane module operational life for the first complete set of membrane modules provided with the system for operation within the parameters established by the Conditions specified in Section 3.4.1. The Membrane module warranty shall remain in full force and effect as long as the membrane module(s) are operated, cleaned, and stored (during shutdown) in accordance with Supplier's Operation and Maintenance Manual at the specified operating conditions. The Owner shall maintain a log, a copy of which shall be made available to the Supplier upon request, of operating, cleaning, maintenance, and storage data, including data tracking the Supplier's membrane modules by serial numbers from Initial Conditioning forward. The log shall be as set forth in the Operation and Maintenance Manual. Failure to operate and maintain the Membrane Filtration System in accordance with the Supplier's Operation and Maintenance Manual may void the membrane Module Operational Life Guarantee. The membrane module operational life will be deemed to have ended when either one of the following two conditions is observed:

Loss of Clean-Membrane Clarified Feedwater Permeability: During the Commissioning Test, the lowest observed ten (10) minute average clean-membrane transmembrane pressure (TMP) will be recorded. This observed value will be the benchmark to determine whether future operational TMP's (corrected for temperature to 20 deg. C.) are within the specified allowance for determination of membrane module operational life. TMP will be adjusted based on the following formula:

$$TMP20^{o}C. = \frac{TMP_{Observed}}{e^{(-0.029*(TObserved-20))}}$$

The membrane module's operational life will be deemed to have ended when (1) the module exhibits a loss of membrane specific flux (temperature-corrected flux per unit transmembrane pressure) equivalent to 50% or greater from the benchmark clean-membrane transmembrane pressure (TMP) that was recorded during the Commissioning Test; or (2) the module TMP becomes greater than the maximum allowable TMP over the entire membrane life as stated by

the Supplier in its proposal in Section 3.4.5B; or, (3) the required membrane cleanings exceed the Guaranteed Maximum Number of Chemical Cleanings per year stated by the Supplier in its Proposal in Section 3.4.2, Line U by 50% or more.

1. Loss of Hollow-fiber Integrity: The membrane module's operational life will be deemed to have ended when the total fiber breakage per membrane module exceeds a total of 1% of the total supplied fibers for the module.

The guaranteed membrane module operational life shall be the number of years stated by the Supplier in its proposal in Section 3.5.2, Line E. Required operational repairs due to broken fibers will be performed by the Owner except when the total fiber breakage per module exceeds the amount specified in Paragraph 2 above. Membrane module housing, and other components integral to the membrane module housing and the gasket or seal interface between the membrane and the membrane filtration system piping, shall be guaranteed for the number of years stated by the Supplier in its proposal in Section 3.5.2, Line E. The Guaranteed Membrane Module Operational Life shall begin either upon acceptance or 12 month from delivery of membrane modules if the Membrane Filtration System is not accepted due to circumstance beyond the control of the Supplier, whichever occurs first.

The Guaranteed Membrane Module Operational Life shall be for a minimum five (5) year period with the full replacement cost for failure during the first two (2) years at the sole responsibility of the Supplier. The remaining Guaranteed Membrane Module Operational Life period shall be prorated according to the following cost sharing schedule:

a) The period from the beginning of the Guaranteed Membrane Module Operational Life to 24 months after the beginning of the Guaranteed Membrane Module Operational Life: 100% Supplier/ 0% Owner.

b) The period from the beginning of the Guaranteed Membrane Module Operational Life to the end of the Guaranteed Membrane Module Operational Life (as entered in Section 3.6): Supplier shall replace the failed membrane module (s) based the following price basis:

Time to end of GMMOL	% Responsibility of Supplier
0 to 2 years	100%
2 yrs to 40% of GMMOL	80%
40% to 60% of GMMOL	60%
60% to 80% of GMMOL	40%
80% to 100% of GMMOL	20%

c) The price schedule shall be calculated by determining the time represented by the date the Authority determines that the membrane module's operational life has ended due to Loss of Clean-Membrane Clarified Feedwater Permeability or Loss of Hollow-fiber Integrity, as a ratio of the Guaranteed Membrane Module Operational Life and multiplying the then current replacement price, F.O.B. Oregon City, OR rounded to the nearest dollar by the corresponding percent responsibility of the Supplier. For example, if the warranty period is 5 years and the membrane module's operational life has ended 830 days into the warranty period, and the then current replacement price (specified in Section 5.9C), F.O.B. Oregon City, OR, is $5,000 per membrane module, the price would be calculated as follows:

60% x $5000 = $3,000

Therefore, under the conditions specified in the above example, the Authority would receive a new membrane module for $3,000, F.O.B. Oregon City.

d) The Period following the Guaranteed Membrane Module Operational Life (Section 3.6) after the beginning of the Guaranteed Membrane Module Operational Life: 0% Supplier / 100% Owner.

In the event of any failed membrane module (s), the Owner shall provide Supplier with written notice to the failure and, for failures related to TMP, include in such notice, at least seven (7) calendar days advance notice of its intent to remove the membrane module (s) from service. Supplier shall have the option during such advance notice period to send in a technician to witness the membrane module (s) in operation prior removal.

Any failed membrane module (s), if requested by Supplier at the time of shipment of he replacement module (s), shall be returned to Supplier at Supplier's expense (Supplier shall pre-pay shipping costs) within one (1) month of Owner's receipt of the replacement module (s). Modules shall be shipped either in the same packaging as the replacement module (s) or other packaging as specified by the Supplier. Should the Owner fail to return any module(s) requested by the Supplier, the Supplier may require the Owner to remit the difference between any amount paid by the Owner for the replacement module and the full replacement cost of the module (s) to the Supplier.

C. Guaranteed Membrane Module Replacement Cost: The Supplier shall guarantee the maximum price of replacement membrane modules. The Supplier agrees to accept this price per module for membrane replacement for additional purchases not associated with a warranty or performance claim, for each new module purchased within a period equal to the Guaranteed Membrane Module Operational Life (stated in Section 3.6) plus one year beginning with the actual date of delivery of the Equipment. The Membrane Module Replacement Cost shall be the number of dollars per module stated by the Supplier in its proposal in Section 3.4.3, subject to increase provided that such increases shall not exceed upward adjustments made in Consumer Price Index ("CPI") per year or 5% per year, whichever is less. The CPI shall be All Urban Consumers- Northeast. The base point for calculation of upward adjustments to the CPI will be the latest CPI index published as of the date of acceptance or 12-months after delivery of the membrane modules, whichever comes first. The comparison point for the CPI adjustment will be the latest CPI index published as of the date when a replacement module order is made by the Owner.

5.10 Measurement and Payment

5.10.1 Scope

Reference is made to 4.2 PRICE and 4.20 PAYMENTS.

Direct payment will be made only for the items listed in the SCHEDULE OF QUANTITIES AND PRICES. Items of work, materials or equipment not listed, but necessary to satisfactorily complete the equipment, will not be paid for separately and all costs in connection therewith shall be included for payment with the listed items.

5.10.2 Membrane Filtration System

The Membrane Filtration System including all required components and subsystems, satisfactorily completed, will be paid at the applicable lump sum price stated in the SCHEDULE OF QUANTITIES AND PRICES for the item(s) listed below:

Item No. 1- Membrane Filtration System

Progress estimates will be made in accordance with the following schedule:

Fabrication Drawings Satisfactorily Complete.....	5%	No Sooner than Feb 13, 2004
Fabrication of Membrane Skids and Skid-Mounted Components.....	30%	No Sooner than Aug 1, 2004
Fabrication of Membrane Modules.....	30%	No Sooner than Dec 1, 2004
Delivery of non skid mounted subsystems and components	10%	No Sooner than Sep 6, 2005
Delivery of all Membrane Filtration System Components.....	10%	No Sooner than Jan 1, 2005
Delivery of Satisfactory O&M Manuals.....	5%	
Satisfactory Completion of Commissioning Test.....	10%	
Satisfactory Completion of 11-month Warranty Performance Test...	Performance Bond	

5.10.3 Shipping

Shipping of the equipment to the location specified, satisfactorily completed, will be paid for at the lump sum price stated in the SCHEDULE OF QUANITIES AND PRICES for each item(s) listed below:

Item No. B- Shipping

5.10.4 Technical Services

Technical services, satisfactorily completed, will be paid for at a pro-rata basis based on the number of days of service required as specified in the contract documents and the Suppliers submittal of the number of days of technical service provided. The pro-rata calculation shall be based on the lump sum value stated in the SCHEDULE OF QUANITIES AND PRICES for each item(s) listed below:

Item No. C- Technical Services

5.10.5 Pilot Plant Validation Study

The pilot study validation study, satisfactorily completed, will be paid for at the lump sum price stated in the SCHEDULE OF QUANITIES AND PRICES for each item(s) listed below:

Item No. D- Pilot Plant Validation Study

5.10.6 Extended Storage of Membrane Filtration System

A. Definition: Extended storage of Membrane Filtration System is the dollar amount that fully compensates the Supplier for storage up to a period of six (6) months should the Authority extend the time for the delivery of Membrane Filtration System to the job site beyond the Authority desired delivery date specified in 2.2. Reference is made to 4.6 DELAYS.

Extended storage shall cover at least the following items:

1. Overhead fixed and variable expenses

2. Miscellaneous expenses (protection of Membrane Filtration System equipment components, quality control)

3. Additional handling and transportation expenses

4. Insurance

5. Interest expenses to finance material furnished

6. Profit

B. Measurement: Extended storage will be rounded up to the nearest unit as the number of months that the Owner extends the time of the delivery of the Membrane Filtration System to the job site beyond the Owner desired delivery date specified in 2.2.

C. Payment Extended storage will be paid for at the unit price stated on the SCHEDULE OF QUANITTTIES AND PRICES.

SECTION 6

MEMBRANE SYSTEM SPECIFICATIONS

PART 1: GENERAL

1.01 SUMMARY OF SECTION

A. The Supplier shall supply, deliver, and assist with installation and start-up of a low pressure membrane system including the following equipment: membrane elements, all pumps, air movers, piping, valves, instrumentation & controls and other accessories. All system components will be complete and operable, sized to treat the required volume of the specified water in accordance with the requirements of the Contract Documents. The membrane filtration system shall meet the specified service and performance requirements for each of the specified Operating Conditions included in these specifications. Requirements and materials not specified by the OWNER shall be selected by the Supplier for the specified performance requirements and environmental conditions, based on its standard practice.

B. Principal items specified herein are:

1. Membrane units and assemblies
2. Pre-filtration strainer system
3. Filtrate Pumps
4. Backwash system including pumps and chemical dosage equipment (as applicable)
5. Clean-in-place equipment and CIP waste neutralization system including chemical storage and dosage equipment
6. Membrane integrity testing system
7. Air system: compressor, receiver, blower and post-treatment equipment
8. Specialized tools and maintenance equipment
9. Spare parts
10. Instrumentation
11. Control System and Control Panels
12. Piping and Instrumentation Diagrams (P&ID's)
13. Logic Diagrams

1.02 REFERENCED CODES AND SPECIFICATIONS

Reference to standards, specifications, manuals or codes of any technical society, organization or association, or to the laws or regulations of any governmental authority, whether such reference be specific or by implication, shall mean the standard, specification, manual, code or laws or regulations in effect on the last day for receipt of Proposals.

The provisions of the Contract shall take precedence in resolving any conflict, error, ambiguity or discrepancy between the provisions of the Contract and, the provisions of any such standard, specification, manual, code or instruction (whether or not specifically incorporated by reference in the Contract); the provisions of any such laws or regulations applicable to the performance of the work

(unless such an interpretation of the provisions of the Contract would result in violation of such law or regulation).

No provision of any such standard, specification, manual, code or instruction shall be effective to change the duties and responsibilities of OWNER, Proposer or any of their subcontractors, consultants, agents, or employees from those set forth in the Contract.

Unless otherwise specified, the equipment covered by this specification shall be designed, manufactured and tested in accordance with the latest applicable standards of:

A. American National Standards Institute (ANSI)

B. American Society for Testing and Materials (ASTM)

C. Institute of Electrical and Electronics Engineers (IEEE)

D. National Electrical Code (NEC)

E. National Electrical Manufacturer's Association (NEMA)

F. OSHA (Federal) and State OSHA (State of Oregon)

G. National Sanitation Foundation (NSF)

H. American Waterworks Association (AWWA)

I. Not Used

J. Instrument Society of America (ISA)

K. Underwriter's Label (UL)

1.03 GENERAL SUBMITTAL AND REVIEW REQUIREMENTS

A. Detailed submittals are required for the following reasons:

1. Allow the ENGINEER to complete the design of the overall water treatment facility, ancillary systems and equipment interfaces between the membrane filtration system and other existing and new equipment not furnished by the Supplier.

2. Assist third party Contractors in their preparation of bids to install the Membrane Filtration System equipment.

3. Assist the OWNER and ENGINEER in making an early determination of whether it will request changes to some aspect of the membrane filtration system during the design/fabrication process.

B. Number of submittal copies required:

1. Fabrication Schedules: Submit five (5) copies.

2. Product, Material and Fabrication Submittals: Submit five (5) copies of Supplier data and drawings. Resubmit five (5) final copies if requested by ENGINEER.

3. Shop Drawings: Submit five (5) copies. After final review by the ENGINEER and OWNER, the Supplier shall submit final electronic files (Microstation J).

4. O&M Manuals: Submit six (6) copies. Submit (6) copies of replacement pages of final manual.

C. One (1) copy of each submittal will be returned to the Supplier showing the review actions taken.

D. On each shop drawing and submittal, the Supplier shall provide a space for the ENGINEER'S status stamp and shall provide a title block and/or letter of transmittal showing:

1. Name of the project.
2. Name and address of the Supplier.
3. Name and address of supplier, manufacturer, or distributor, 'as applicable.
4. Date, scale of drawings, and identification number of product with specification.
5. Date of submission and dates of any previous submissions; include revision number(s).
6. Supplier's review and internal approval information.

E. The Supplier shall schedule the following time periods for ENGINEER and OWNER review of submittals. Time will be measured in calendar days after receipt by the ENGINEER of complete information related to any submittal.

1. Fabrication Schedules: 7 calendar days
2. Fabrication Drawings:

   Initial Submittal: 14 calendar days

   Resubmittals: 7 calendar days for each required resubmittal
3. For submittals covering products, materials and equipment:

   Initial Submittal: 14 calendar days

   Resubmittals: 7 calendar days for each required resubmittal
4. O&M Manuals:

   Initial Submittal: 30 calendar days

   Resubmittals: 14 calendar days for each required resubmittal

F. A submittal schedule is required. Submittals shall be shown as activities in the Fabrication Schedule.

G. Supplier shall not proceed with fabrication of any particular component of the membrane filtration system without receiving notice that the ENGINEER has reviewed the applicable submittal(s).

H. Permission to proceed does not relieve the Supplier from full compliance with the Membrane Filtration System performance requirements of, nor does it constitute acceptance or approval of design details developed or materials selected by the Supplier.

1.04 SUBMITTAL REQUIREMENTS

Unless otherwise specified, all submittals shall be made to the ENGINEER, a minimum of thirty (30) days prior to fabrication. The various types of submittals required, definitions of Submittal Categories and required contents are specified below:

A. Product Information. Supplier shall submit original manufacturer's literature showing all drawings and descriptive data and brochures of each item of equipment and technical information for the item including, but not limited to, catalog or manufacturer's number, ordering information, figures and diagrams, materials, options, dimensions, performance and electrical information. Electrical information shall include a wiring diagram and operational description.

B. Shop Drawings. Supplier shall submit copy of drawings which it intends to use to fabricate the equipment. This includes, but is not limited to, arrangement, layout, and dimensions of all components of the membrane units, spool drawings, internal piping and wiring, cross sections, internal details, structural details pumps, valves and a parts list. Drawings shall show sufficient details and information to connect equipment to wires, pipes, vents, drains, conduits, anchors, supports, and all other items, either Supplier-furnished or OWNER-furnished, required to make the membrane filtration system fully operational. The diagrams shall include, but not be limited to: wire terminal designations and numbers, field wiring diagram showing all required interconnections labeled consistently with terminal markings, opening sizes and connection type, elevations, dimensions, manufacturer's recommendations, anchorage details, and electrical information. Additionally, drawings shall show sufficient detail for the ENGINEER/Installation Contractor to design, fabricate, support, anchor, and install piping not furnished by the Supplier. This shall include, but not be limited to: dimensions, coordinates, linings, coatings, connections, layout, isometrics, support, anchorage, openings, materials, tie-in locations, thicknesses, standard connection details, reference size and fluid according to drawing abbreviations and symbols, reference drawing sheet number piping is shown or is located, slope, elevation, and details. The Supplier's proposed method of pipeline construction shall be outlined. The drawings shall also include Supplier-verified locations of all tie-in points.

The OWNER will consider waiving certain shop drawing submittal requirements for certain Equipment components if 1) the Supplier notifies the OWNER that the Supplier considers the requested information to be proprietary or covered by a patent and 2) the OWNER determines that the requested information is not required for the proper installation, start-up, operation, troubleshooting and maintenance of the equipment. If the OWNER determines that the requested information is required, the requested information shall be submitted by the Supplier and protected by the OWNER in accordance with the procedures specified in Section 4.12.2.

The shop drawings shall be "Guaranteed," meaning that the Supplier agrees that it will not make any changes to the membrane filtration system design details that may affect other equipment and materials not furnished by the Supplier following the ENGINEER'S final review. Although the Supplier shall be permitted to procure materials and lower level subcomponents from suppliers without the prior written consent of the ENGINEER, any additional costs incurred by the OWNER due to the Supplier making fabrication changes subsequent to the final ENGINEER review of shop drawings without prior authorization from the OWNER shall be reimbursed by the Supplier. The Supplier agrees that its use of any suppliers shall not relieve it of its responsibilities for the Membrane Filtration System.

C. Erection/Installation Instructions. Supplier shall submit detailed written instructions, procedures, recommendations, and drawings required to erect or install the membrane filtration system. The Erection/Installation instructions shall be sufficient for the Installation Contractor to properly place, anchor, install and connect all membrane filtration system components and subassemblies both to each other and to other equipment not furnished by the Supplier. The Erection/Installation Instructions shall include as a minimum the following: unloading, handling, storage, installation sequence, connection procedures,

alignment requirements, plumbness requirements, assembly of shipped loose components, protection of components, wiring and termination requirements, checkout procedures, etc. for all Supplier-furnished components and subsystems.

D. Corrosion Resistance Certification. Supplier shall submit certification that the materials and/or coatings will not corrode or deteriorate and that their performance will not be adversely affected by the fluids and/or operating environment for at least 10 years. Notwithstanding the generality of the foregoing, the corrosion resistance certificate shall exclude the membrane modules and the gasket/seal interfaces between the membrane modules and membrane filtration system piping (which are subject to separate express warranties) and normal consumables and wear items (such as pipe flanges and pump seals).

E. Seismic Certification. Supplier shall submit certification, prepared by a civil or structural engineer registered in Oregon, together with stamped calculations supporting his written certification, that the Membrane Filtration System meets the seismic requirements specified in Paragraph 2.01 J herein.

F. NSF 61 Certification. For all surfaces contacted with process water, Supplier shall submit manufacturer's certification that wetted materials and coatings meet the National Sanitation Foundation requirements of NSF 61 for contact with potable water.

G. Piping and Instrumentation Diagrams (P&ID's). Supplier shall submit piping and instrumentation schematics per Instrument Society of America (ISA) standards showing all equipment (with equipment name and number), pipes (with the size, process fluid, and pipe material), valves (with valve numbers), analyzers, PLC addresses, instruments and electrical devices. The diagrams shall delineate the scope of supply and shall include interfaces. P&IDs for equipment shall include all piping, appurtenances, subcomponents, instruments, valves, etc., and schematically represent the function, interconnection, and interaction of all items.

H. Not Used

I. Control Panel Fabrication and Wiring Details. Supplier shall submit information and drawings of the panel's interior and exterior elevations, drawn to scale, and detailing all equipment in or on the panel. Also include information on, nameplates, conduit access locations, mounting provision, anchorage details, panel construction and details, manufacturers' model numbers, and color selection.

J. Instrumentation List. An instrumentation list shall be prepared by the Supplier to include manufacturer and part number, I/O address number, and Instrument or PLC number. Instrument list shall be submitted in Excel format and 8-1/2" x 11" hard copy format. The instrumentation list shall include all analog instruments, limit switches, position transmitters, hand switches, indicator lights, etc.

K. Coordination Spreadsheet. Supplier shall submit a spreadsheet in Excel format that details the data to be transmitted between OWNER'S plant control PLC and Supplier's PLC. Details shall include a description of each data point, the engineering units, range, precision and PLC address. All conversions to engineering units shall be performed in Supplier's PLC. Supplier shall group data points by precision. Supplier shall submit spreadsheet before completion of equipment fabrication.

L. Special Tools and Spare Parts. Supplier shall submit a listing and description of all special tools and/or spare parts required to be supplied with the equipment. Additionally, the Supplier shall provide a listing of available spare parts not necessarily provided, with the equipment. The listing will include: spare part names, catalog numbers, prices, shipping information, diagrams, distributor's sales contact and phone number.

M. Operating and Maintenance (O&M) Manuals. Supplier shall submit printed instructions for the handling, storage, installation, maintenance, operation and cleaning of the membrane filtration system. O&M Manuals shall include the following:

1. General:

   a) Paper shall be 20 lb minimum, white, 8-1/2" x 11"typewritten or manufacturer's printed data.

   b) Provide indexed tabs where appropriate.

   c) Binder shall be commercial quality 3-ring binders with durable and cleanable plastic covers and 1" minimum ring size. When multiple binders are used, correlate data into related consistent groupings.

   d) Manuals shall be applicable to equipment actually furnished with general sections related to other models deleted.

   e) If the Supplier transmits any documentation or other technical information which it considers proprietary, such information shall be designated. Documentation or technical information which is designated as being proprietary will be used only for the design, construction, operation, or maintenance of the system and, to the extent permitted by law, will not be published or otherwise disclosed.

2. Drawings and Labeled Pictures:

   a) Provide reinforced punched binder tab, bind in with text, fold larger drawings and insert in plastic pockets held in place by 3-hole binder.

   b) Supplement product data with Drawings and Labeled Pictures as necessary to clearlyillustrate relations of component parts of equipment and systems and control and flow diagrams.

3. Products:

   a) Provide original copies of information sheet(s) for each separate product, or each piece of operating equipment. Provide typed description of product, and major component parts of equipment. Include function, normal operating characteristics, and limiting conditions, performance curves, engineering data, and tests.

4. Required Text:

   a) Describe the detailed preventive and corrective procedures required to keep the membrane filtration system in good operating condition: Provide logical sequence of instructions for each procedure. Include instances which might affect validity of warranties.

   b) Provide operation information: This information shall include a detailed description of how the equipment operates and a block diagram illustrating each major assembly in the equipment. Include written text, as required to supplement product data for particular installation. Provide step-by-step procedures for starting up or shutting down the entire system, including a step-by-step procedure for reloading all applicable software. Additionally, a detailed description of the operation of the Operator Console, including all appropriate displays shall be included.

c) Provide recommended maintenance instructions: Include list of lubricants required, including time intervals for lubrication, adjustments, etc., on all new equipment, and a list of all required lubricants (including a notation as to lubricant used initially in each item of equipment). For each required lubricant, a list of acceptable equivalents from at least one different major manufacturer whose products are locally available near Project Site shall be provided. Provide predicted life of parts subject to wear. Include special handling and disposal requirements.

d) Provide corrective-maintenance instructions: These instructions shall include proper procedures in event of failure and guides for locating malfunctions. These guides shall include adequate details for quickly and efficiently locating the cause for an equipment malfunction and shall state the probable source(s) of trouble, the symptoms, probable cause, and instructions for remedying the malfunction.

e) Provide parts information: This information shall include the identification of each replaceable or field-repairable component.

f) Provide Software Documentation: This information shall provide a detailed description of the entire software system. This documentation shall be sufficient for software maintenance and modification of the entire software system. The Software Documentation shall include an overview of the program, a narrative describing exactly how the program works, a flowchart to clarify the narrative description, a list of variables used by the program including the function of each, a descriptive copy of the ladder logic (hard and electronic copies), wiring and loop diagrams and graphic screens for the control panel.

g) Provide safety and emergency instructions. Provide MSDS's for all proprietary chemicals.

h) Test Reports. Provide all test reports as required in these specifications.

PART 2: PRODUCTS

2.01 MEMBRANE FILTRATION SYSTEM DESIGN REQUIREMENTS

A. The design of the system shall be such that pumps, air movers, and other equipment which serve a common function may be installed remotely from the membrane trains or cells themselves in a common location. For all such equipment, one additional stand-by item of equipment shall be provided for each type of equipment with a capacity greater than or equal to the largest duty item of equipment, to provide for redundancy for the system as a whole. For example, if two duty backwash pumps are required to meet all of the Operating Conditions, a third, stand-by pump of at least equal size shall be provided in addition to the duty pumps.

B. The membrane filtration system shall be designed to filter raw water supplied from the Clackamas River.

C. The Supplier shall provide a membrane filtration system configured to meet the following general design criteria:

1. Design flux equal to or less than 80% of the Supplier's California, Oregon or Washington State certified value.
2. Minimum Daily Operating Recovery = 92%
3. Number of Trains or Cells = four (4) installed and six (6) ultimate
4. Allowance for installation of 10% additional membrane capacity in each train/cell
5. Minimum of 30 minutes retention time between backwashing cycles (non-chemical backwashes)
6. Chemical washing must not occur more than once within a 24 hour period
7. Chemical cleaning must not occur more than once every 30 days

D. The Supplier shall provide a membrane filtration system sized and configured to meet the Operating Conditions specified in Table 6-1 and under the Pre-Treatment Conditions described in 2.01.E, below. Individual anticipated raw water parameters may be altered if agreed upon by both the OWNER and the Supplier. In the event the raw water conditions or pretreatment chemical addition exceed the range established in Table 6-1 or as specified in Section 2.01.E, thus resulting in short-term conditions in excess of the parameters established, all warranties will remain in full force and effect provided that Supplier is excused from any performance obligations affected by the excess condition for the period the excess condition exists and for any subsequent period required to return the membrane filtration system to normal operation. The minimum capacity identified in Table 6-1 represents the minimum flow produced by the system in one 24 hour period with all trains in service.

Table 6-1. Projected Raw Water Quality Data

	Water Temperature		Turbidity			Average	Min
Month	Min C	Max C	Ave (NTU)	Max 72 hr Ave (NTU)	Max 8 hr Ave	TOC (mg/L)	Capacity (mgd)
Jan	5	10	6.5	60	80	0.9	8
Feb	6	10	6.3	70	100	1.2	8
Mar	6	13	5.3	40	75	1.0	8
Apr	7	15	3.5	40	70	0.8	8
May	8	19	2.4	15	25	0.9	8
Jun	11	23	1.7	5	20	1.1	8
Jul	15	25	1.8	5	10	1.2	10
Aug	15	25	1.1	5	10	0.7	10
Sep	15	22	1.3	5	10	0.7	10
Oct	9	17	1.5	5	15	0.9	8
Nov	7	14	7.8	140	220	1.1	8
Dec	5	12	9.1	120	235	1.5	8

E. Pre-Treatment Chemical Addition. The membrane filtration system performance requirements specified herein shall be met regardless of the fact that several treatment chemicals may be added to the raw water by the OWNER upstream of the membrane process. The OWNER may add any or all of the following treatment chemicals at the doses as follows:

Powdered Activated Carbon: - 50 mg/L max dose during seasonal T&O events that are projected to occur between July and September and last up to 3 weeks
- 0 mg/L during remainder of year

Alum or ACH:	- 20 mg/L max dose during storm events that are projected to occur between Nov and Feb and last 3 days - < 10 mg/L during winter season (Nov thru Feb) in absence of storm event - 0 to 5 mg/L during remainder of the year
Sodium Hypochlorite	2 mg/L max dose year round

F. The membrane system shall use on-line treated water particle counts as an on-line integrity testing methodology. Each train or cell provided with the membrane system shall include an effluent particle counting device (MetOne, Model PCX) which will continuously monitor treated water particle counts. In the event that treated water particle counts continuously exceed a user programmable setpoint for a user-programmable time period in the permeate from that skid, the PLC Program will automatically shut down the offending skid for diagnostic testing for identification and isolation of broken fibers.

G. The membrane system shall also include an automated system for off-line diagnostic testing for isolation and identification of broken fibers, such as pressure hold testing or other methodology approved by the ENGINEER and the Oregon Department of Human Services, Drinking Water Program.

H. Noise Levels. If the system as a whole generates noise levels in excess of the following maximum tolerable noise levels, measures shall be taken in the construction of the skid, including the provision of soundproof enclosures where necessary, to limit noise levels to below these specified levels:

1. Maximum Tolerable Continuous Noise Level: 85 dBA (measured 3 feet from equipment).
2. Maximum Tolerable Intermittent Noise Level: 105 dBA for one hour exposure (measured 1 foot from equipment).

In the case that noise levels of the operating plant are measured to be higher than the values stipulated above, the Supplier shall provide soundproofing at no additional cost to the OWNER.

I. Not Used.

J. Seismic Requirements: The membrane filtration system shall meet Uniform Building Code (UBC) requirements for Zone 4, as follows:

1. Membrane filtration equipment skid assemblies and other Supplier-furnished remote equipment and anchorage shall resist shear, bending and overturning moment along the three orthogonal axes of the skid. Seismic stresses for skid, equipment mounting, anchorage, etc. shall be based on requirements stipulated by UBC, Zone 4, for a specific peak horizontal ground acceleration of 0.22g. The importance factor, where applicable, shall be 1.5.
2. Design seismic stresses for individual skid-mounted equipment components shall be based upon a minimum horizontal acceleration of 0.22g.

K. Underwriters Laboratories (UL) Requirements: All membrane filtration system components that can be labeled by Underwriters Laboratories shall be labeled as such.

L. Bus and Wiring Testing: All membrane filtration system components shall be completely assembled, wired, and tested at the factory, if applicable. All buses and wiring shall be given a dielectric test in accordance with the latest IEEE and NEMA standards.

M. Corrosion Resistance: The membrane filtration system components, materials and/or coatings shall not corrode or deteriorate and their performance will not be adversely affected by the below-specified fluids and/or operating environment for at least 10 years. Notwithstanding the generality of the foregoing, the corrosion resistance certificate shall exclude the membrane modules and the gasket/seal interfaces between the membrane modules and membrane filtration system piping (which are subject to separate express warranties) and normal consumables and wear items (such as pipe flanges and pump seals).

1. Fluids

   a. Clackamas River water will be as specified in Sections 1 and 3 herein.

   b. The Supplier and ENGINEER shall agree prior to the introduction of any cleaning and/or backwash solutions or any other material not specified in either these specifications or the Supplier-furnished O&M manuals.

   c. In order to maintain all warranty provisions, the ENGINEER will consult the Supplier and receive approval in writing prior to the introduction of any chemicals that are either not specified herein or included in the Supplier-furnished O&M Manuals.

   d. No solvents or volatile organic compounds (VOC) will be introduced within the membrane filtration system or membrane modules at any time.

   e. No solvents or volatile organic compounds (VOC) will be used on exterior surfaces of the membrane filtration system or membrane modules at any time.

   f. Membrane permeate with hardness less than 60 mg/L as calcium carbonate will be used for Chemical Cleanings.

2. Operating Environment

   a. All membrane filtration system components will be installed and operated in an unheated building unless otherwise agreed upon by the Supplier and OWNER. Upon delivery of the equipment or membrane filtration modules, as applicable, the OWNER acknowledges and agrees that it will not permit the equipment or membrane filtration modules to be exposed to temperatures of 0°C or less.

2.02 SCHEDULE OF EQUIPMENT

The membrane filtration system shall include as a minimum the equipment listed below. The scope of supply shall include all necessary accessory equipment and auxiliaries, whether mentioned herein or not, for a complete and operable membrane filtration system. Reference is made to paragraph 2.01.

A. Where mechanical equipment is shared between a number of membrane units, the Supplier shall include at least one stand-by unit.

B. Membrane filtration units. All units provided for plant operation shall be fitted with the same number of membrane elements.

C. Fully operable strainer systems for pre-filtration of Clackamas River raw water. Pre-strainer systems must be self-backwashing with the appropriate opening size to protect the downstream membrane equipment, and include all necessary pumps, valves and appurtenances

D. A complete permeate/backpulse pumping system including pumps, air separation columns, air removal vacuum pumps, and all associated valves, instruments and appurtenances.

E. A complete backwashing system, including backwash pumps, backwash waste equalization tank, piping, valves, chemical dosing equipment as necessary, appurtenances, instrumentation and controls. The scope of supply shall include all equipment and materials necessary to provide a fully operable backwashing system.

F. A complete clean-in-place system suitable for periodic chemical cleaning of the membranes for recovery of membrane permeability (specific flux). The scope of supply shall include all equipment including backwash water storage facilities, heating facilities as necessary, chemical dosing and chemical storage equipment, piping, valves, appurtenances, instrumentation and controls. All materials necessary for a fully operable chemical cleaning system shall be provided.

G. A complete oil-free instrument air quality compressor system, including filters, duplex air compressors, dryers, receiving tank, drains, valves, interconnecting wiring and piping, and automatic controls. The completely operable instrument air production and air filtration system shall be provided for operation of the pneumatic valve system and for membrane integrity testing, i.e., air-pressure hold testing. The compressed air package shall include a duplex air compressor.

H. All specialized tools and maintenance equipment required for maintenance of the membrane system as a whole. This shall include any specialized lifting equipment required for removal, replacement, fiber plugging and manipulation of the membrane modules or any other equipment included with the plant which would not normally be considered to be required in a conventional water treatment plant.

I. Sufficient spare parts for at least one year of routine operating and maintenance requirements for the membrane system.

J. All membrane unit support frames shall be constructed of 304 SS.

K. All piping, fittings, valves, electrical and control conduits internal to each of the following: the membrane skids, Supplier-furnished stand-alone systems (e.g. the clean-in-place system) and Supplier-furnished remotely mounted equipment. Piping for membrane units shall be constructed of stainless steel, with flanged valve or equipment connections. Unions shall be provided to allow for the removal of valves, meters and other equipment requiring maintenance.

L. Each train or cell shall be provided with a panel for collecting water samples from the feedwater, permeate, bleed or reject water piping, and backwash waste piping. Sample panel shall be stainless steel. Drain line from sample collection panel will be connected by others to a floor drain system. The sample panel shall be so equipped to prevent splashing and to provide adequate drainage of sample fluid and be easily accessible without any special tools, ladders.

M. All chemical storage and chemical feed systems required for clean-in-place maintenance of the membrane filtration system. Sizing of chemical storage facilities shall be based upon the Supplier's recommended capacity.

N. Mechanical gauges, flow meters and analytical equipment necessary for automatic operation, routine maintenance and trouble shooting. As a minimum, the following on-line analytical measurement devices shall be included per train or cell, with measurements continuously recorded and monitored by the membrane filtration system PLC:

1. Raw Water particle size counter (only one for complete system)
2. Tank level sensor
3. Permeate pressure
4. Feedwater temperature
5. Feedwater flow
6. Permeate production flow rate
7. On-line particle size counter, MetOne PCX
8. Combined permeate turbidity (Hach Model D)

O. Automatic valves with actuators shall be provided for process valves.

P. The membrane control system shall consist of, but not be limited to, the following principal hardware components:

a) NEMA-4 stainless steel enclosure with fan, fan switch, and filtered louvers.
b) Redundant master processors with auto switchover and redundant power supplies.
c) All necessary I/O cards to provide a complete automated control system for the membranes.
d) UPS power supply to provide backup power for two (2) hours, and a manual transfer switch between normal power and UPS power.
e) Two (2) spare I/O cards of each type, one spare processor of each type, spare power supply, spare communications card.
f) Hardwire control contacts for backwash pumps.
g) Ethernet data highway connection via a fiber optic data highway to the plant control system Programmable Logic Controller (PLC).
h) Individual PLCs, complete with power supply and I/O cards, on each membrane filtration unit (interconnecting data highway to be furnished by others).
i) Panic stop button located on the control panel and contacts for a remote stop button.

Q. The membrane control system shall be provided with, but not limited to, the following principal software components:

a) A PLC program in conventional ladder logic to provide complete automatic operation of the membranes including automatic backwash, startup, shutdown, emergency shutdown on equipment failure, and stopping and restarting on a power outage.
b) Interlocks and control logic for backwash systems, air scour systems, and clean-in-place.
c) Communication with the Plant SCADA System to send and receive commands to control all necessary equipment pertinent to the membrane functions on an Ethernet fiber optic data highway.
d) Set of graphic screens to load onto the plant control system workstation to show operating data and control points for each membrane using Wonderware software.
e) Programming and configuration of the individual unit PLC's, main PLC, and graphics software and screens.
f) The membrane supplier shall provide, but not be limited to, the following documentation:
   - Descriptive copy of the ladder logic (hard and electronic copies) and screens.

- A manual providing an operating description of each control point and data point for the membrane control graphic screens.
- Wiring and loop diagrams.

R. Each pair of membrane trains shall be provided with a NEMA-4 stainless steel control panel (i.e., 2 panels required for 4 trains). Each control panel shall include all necessary controls, fuses, disconnects, PLC's, transformers and starters for operation of the membrane unit appurtenant equipment including feed pumps. The control panel shall accept a 480V, 3 phase, 60 HZ, 100A circuit.

S. Membrane tanks used for submerged membrane systems shall be constructed of concrete by the Installation Contractor.

PART 3: EXECUTION

3.01 INSTALLATION OF MEMBRANE UNITS

A. Reference is made to Section 5.6. Supplier shall assist in the installation and start-up of the membrane filtration system equipment. During or before start-up, the Supplier shall provide installation review, program loading, communication check-out, and assistance with all required testing of controls. Start-up services shall continue for up to one week after satisfactorily completing the Commissioning Test, as agreed upon by the ENGINEER and Supplier.

B. Installation work of the fabricated skid units and remote assemblies will conform to the Supplier's recommended procedures, instructions, and approved shop drawings, and will be done by others.

3.02 MEMBRANE FILTRATION SYSTEM ENGINEERING TRAINING AND TECHNICAL SUPPORT

A. Required service during engineering design phase. The Supplier shall provide the services of competent and experienced personnel who have complete knowledge of the proper design, programming and operation of the membrane filtration equipment for the duration of the engineering design period. The Supplier's service personnel will attend two (2) site visits, each of 1 work day on-site during the design period to meet with the ENGINEER and OWNER to review the 50% and 90% design submittals.

B. Required services prior to satisfactory completion of the Commissioning Test. The Supplier shall provide the services of a competent and experienced personnel who have complete knowledge of proper installation, programming, operation and maintenance of the membrane filtration equipment for the duration of the start-up period. The Supplier's service personnel will (a) thoroughly train the installation contractor as required (b) instruct the OWNER operations personnel on proper operation, installation, sampling, cleaning, and maintenance of the membrane system (c) inspect the completed membrane system installation, and (d) provide additional operational assistance. Additional requirements are specified in Section 5.6 and paragraph 4.01 herein.

C. Required Training Services after satisfactory completion of the Commissioning Test. Supplier shall be required to provide additional training for the OWNER's Operating and Maintenance staff and to provide on-site technical service, for one year after satisfactory completion of the Commissioning Test. This training and technical support shall be performed at the request of the

OWNER and will be unrelated to any required on-site warranty work required to be performed by the Supplier. Therefore, Supplier shall include the following services in its proposal:

1. Training: 10 workdays of operator and staff training (not including travel time) prior to initiation of the Commissioning Test. Training may be classroom (within 15 miles of OWNER offices) and/or onsite as agreed upon by the OWNER and Supplier.

2. Technical Support: Five (5) site visits, each of two (2) workdays on-site duration, by Supplier's engineer for performance testing of membrane filtration system and system troubleshooting. The OWNER will pay for any additional workdays of technical staff at the Supplier's technical service rates in effect at the time the additional technical services are rendered.

PART 4: TESTING

4.01 TESTING PROTOCOL

A. Additional testing requirements are specified in Section 5.6.

B. The Supplier shall submit to the ENGINEER its proposed testing protocol to be performed during the start-up period and for the Commissioning Test. The testing protocol shall include a test program for all individual components and devices to be performed prior to the Commissioning Test. Testing protocol shall also include sample data collection sheets, schedule, tasks, etc.

C. During the start-up period, the Supplier shall be on-site to complete the testing protocol tasks and to establish steady-state operation required for the Commissioning Test. Representatives of the installing Contractor and the ENGINEER will also be in attendance during the start-up period and Commissioning Test. Prior to performing the Commissioning Test, all components of the membrane filtration system, including membrane modules, shall be operated for a total of at least 144 hours after establishing full membrane system integrity

4.02 DATA COLLECTION AND REPORTING

A. Data Collection during Commissioning Test and during One-Year Warranty Performance Test. Routine data collection will be either recorded in the plant SCADA system or completed by OWNER'S operations staff, who shall distribute the data to both the Supplier and installation Contractor. The OWNER will either perform or pay for all required tests.

1. The performance of the membrane filtration system will be measured as specified in Section 5.6.

2. All instrumentation shall be calibrated and documented prior to the beginning of the Commissioning Test. Calibration shall be in accordance with the procedures supplied by the equipment manufacturer. Documentation shall be on OWNER-furnished calibration sheets. Instrumentation furnished by the Supplier shall be calibrated by the Supplier. Instrumentation furnished by the OWNER will be calibrated by the OWNER or its Installation Contractor. The following operational parameters shall be continuously measured and recorded (frequency shall be furnished by the Supplier with frequency no greater than once every 5 seconds) in the plant SCADA system for the membrane system:

- Feed temperature

- Membrane Train/Cell Water Level
- Permeate Pressure
- Transmembrane pressure (by calculation via Supplier's PLC program)
- Feed flow rate
- Reject flow rate, if applicable
- Permeate flow rate (by calculation via Supplier's PLC program)
- pH
- Feed turbidity
- Permeate turbidity
- Feedwater particle counts
- Permeate particle counts
- Particle log removal through membrane system (by calculation via Supplier's PLC program)

3. The Supplier shall select the following setpoints, alarms, etc. to be entered into the Supplier's PLC program. Once selected, the values shall not, be modified for the duration of the Commissioning test. The Supplier shall furnish to the OWNER the methodology of recordation of all setpoints, alarms, etc.

- Backwash frequency
- Backwash duration
- Backwash rest period
- Permeate flow
- Pressure differential across the membrane module
- Number of membrane elements on-line
- Number of stages on-line
- Operational recovery

4. The following water quality parameters shall be measured by the OWNER on the common permeate and reject (bleed) of the membrane systems. Samples shall be taken after one hour of the start of the Commissioning Test. A second set shall be taken halfway through the test. A final set shall be taken one hour prior to the end of the test:

- pH
- Total organic carbon, mg/L
- Calcium, mg/L
- Magnesium, mg/L
- Alkalinity, mg/L as CaC03
- Hardness, mg/L as CaC03
- Permeate turbidity, NTU

- Feed turbidity, NTU
- Total Iron, mg/L
- Dissolved Iron, mg/L
- Total Manganese, mg/L
- Dissolved Manganese, mg/L
- Total solids, mg/L
- Total dissolved solids, mg/L

B. Test Reports. The Supplier shall submit five (5) copies of a "Commissioning Test Report" to the ENGINEER documenting the results of the Commissioning Test. The proposed format for this report shall be submitted at least 30 calendar days before testing and for ENGINEER review. If requested by the ENGINEER, the Supplier shall modify the form of the report, accordingly. The Supplier shall submit the completed "Commissioning Test Report" within seven (7) calendar days after satisfactory completion of the Commissioning Test. Report shall contain detailed test plans and results for all activities performed during testing. Results from all testing shall be tabulated and graphed as appropriate. Analysis of testing, along with conclusions and recommendations, shall be presented in the test report. The results of all laboratory analyses shall be bound into the report as appendices.

4.03 COMMISSIONING TEST ACCEPTANCE

Concurrently with the preparation of the Commissioning Test Report, the ENGINEER will conduct a parallel review of the data regarding the acceptability of the findings, and determine deficiencies identified by the testing program. If required by the ENGINEER, the Supplier shall repeat the Commissioning Test in accordance with Section 5.6. The results of the Commissioning Test shall used, in part, to determine the acceptance of the membrane filtration system.

4.04 ONE-YEAR WARRANTY PERFORMANCE TEST

A. The OWNER will schedule a one-year warranty performance test to occur eleven (11) months after satisfactory completion of the Commissioning Test.

B. The one-year warranty performance test shall be performed in accordance with the requirements specified in Section 5.6.3. The one-year performance test will be satisfactorily completed when all of the performance requirements specified in 5.9A have been met for a continuous operational period of 48 hours.

SECTION 7

MEMBRANE FILTRATION VALIDATION TESTING

PART 1: GENERAL

1.01 SUMMARY OF SECTION

A. The Supplier shall supply, deliver, assist in installation and start-up, and demobilize a low pressure membrane pilot system including all of the necessary equipment for a fully functioning and automated system for the purposes of validating the guaranteed performance of the full-scale membrane system.

B. The validation testing shall be conducted over approximately a 12 week period to demonstrate membrane system performance under the guaranteed design and operating conditions proposed by the successful Supplier. The validation testing will include two, 35-day test runs at the Supplier's proposed guaranteed performance criteria for the maximum flux and minimum recovery rate. Each test will be conducted with the recycle of backwash wastewater flows to the influent of the system. Approximately two weeks is allotted for mobilization, start-up and demobilization.

C. The pilot unit provided by the Supplier shall be of the same design as the proposed full-scale membrane system.

D. Pilot Testing will be conducted at the site of the North Clackamas County Water Commission Slow Sand Filtration Plant located in Oregon City, OR. The OWNER shall be responsible for providing a covered enclosure for the pilot facilities.

1.02 SUBMITTALS

A. The Supplier shall submit five (5) copies of the following information with its proposal:

1. Pilot unit plans and sections including dimensions
2. Connection points including location, size and connection type
3. Feed water requirements
4. Location and total power requirements

B. The Supplier shall submit five (5) copies of the following information following award of contract

1. Pilot Study Plan
2. Pilot Study Report (draft plus final)

PART 2: PRODUCTS

2.01 TEMPORARY PILOT PLANT

A. The pilot plant shall include a pre-flocculation/PAC contactor including by-pass, membrane filtration, washwater clarifier and recycle system, and chemical storage and dosing facilities. Included in the lump sum price shall be miscellaneous support services which would be required by the OWNER during the 12 week long validation pilot testing period.

B. Pilot Plant Design Criteria

1. The pilot system shall be designed for continuous operation with minimal operator interaction. The plant shall include (as a minimum) the following components:
   a. Inlet chemical injection/mixing manifold incorporating four chemical dosing points, for coagulant, powdered activated carbon, plus two spare dosing points, and an in-line static mixing device for rapid mixing of these chemicals.
   b. A raw water feed tank and product water tank, complete with cover, overflow, inlet and discharge piping, and a valved drain.
   c. Feed pumps for the pilot plant
   d. The Supplier shall provide a 2-stage flocculation / PAC contact chamber, with each stage fitted with variable speed vertical flocculation mixer. The contact chamber shall provide a minimum of 10 minutes of contact time at the design flow. The inlet piping shall be designed so as to allow raw water to be injected into the first stage or the second stage, allowing for contact times of 5 or 10 minutes at the design flow to be simulated.
   e. The Supplier shall provide a washwater holding, clarification and recycle system, with by-pass, designed to mimic the operations of the full-scale system.
   f. The Membrane Pilot Plant shall include all equipment required for a completely functional pilot system, including (as required) feed pumps, vacuum pumps, air blowers or compressors, membrane elements and tank, piping and valve manifolds, programmable logic controller of similar make to the main membrane system instrumentation & controls, feed and product tanks, backwash facilities, and clean-in-place system. All membrane units used in the pilot plant design shall be of exactly the same design (module dimensions, membrane type and materials, etc.) as the modules proposed for the full scale plant.
   g. Chemical Feed Systems: The pilot plant shall include the capability to dose the following pre-treatment chemicals. The pilot plant shall include storage facilities for these chemicals suitable for a 7 days supply at peak production.
      ii. Coagulant: Alum at a dosage up to 20 mg/L
      iii. Powdered activated carbon (PAC), at a dosage up to 50 mg/L.
   h. Instrumentation and Controls: The pilot system shall include an integral PLC, and all instrumentation and controls considered necessary to provide a system which will require minimal operator attention during normal operation, and which will provide for alarm functions for key process events or problems. Communication between the pilot plant PLC and the main plant SCADA system will be completed by others. On-line measurements shall include, but shall not necessarily be limited to, the following:
      - Raw water turbidity
      - Membrane permeate turbidity
      - Membrane permeate particle counts
      - Raw water flow
      - Membrane permeate flow
      - Raw water pH
      - Membrane discharge pressure
      - Raw water temperature

D. Once the temporary pilot plant system has been installed and fully commissioned, the Supplier will undertake a 12 week validation pilot study using this equipment. The lump sum price for the temporary pilot plant shall include the following support services to be provided during this pilot trial.

1. The Supplier shall provide for a qualified and experienced representative to be on-site for a period of 5 days coincident with the completion of installation of the pilot plant, to provide for training of the OWNER'S operations personnel in the operation and maintenance of the pilot plant.
2. The Supplier shall provide its own internal staff for troubleshooting assistance to operations personnel during the pilot test period. The Supplier shall make contact with operator on a weekly basis for this purpose over the 12 week period.
3. Participation in a weekly conference call with the operator, ENGINEER and OWNER to discuss the progress of the study.
4. Attend two (2) on-site meetings with OWNER and ENGINEER. The first meeting will be held prior to submitting pilot study plan and second, upon completion of the draft pilot study report. The purpose of the meetings is to negotiate the pilot study plan and then to review results and make modifications to the proposed design if requested by OWNER or ENGINEER based on the pilot study results.

2.02 PILOT TEST PROGRAM

A. The Supplier shall conduct two, 35-day pilot validation runs. Each run will be conducted at the Supplier's guaranteed membrane flux rate and percent recovery. Each run will contain the following general pretreatment requirements which may require adjustment based on actual raw water quality conditions. Any adjustments to the trial conditions must be approved by the Engineer:

- First Week	No Pretreatment
- Second Week	Alum at 20 mg/L
- Third Week	PAC at 50 mg/L
- Fourth Week	Alum and PAC addition (at agreed upon dosage)
- Fifth Week	No Pretreatment

B. The SUPPLIER shall supply at their expense a complete membrane pilot system to the site for use over the entire 12 week period, including costs for transportation, and all other costs related to rental, delivery, set-up, and demobilization of the pilot plant. Anticipated pilot testing milestones are as follows:

1. Submit Proposed Pilot Study Plan	December 8, 2003
2. Mobilization of pilot plant:	December 8, 2003
3. Pilot Plant fully on-line:	December 15, 2003
4. Completion of Pilot Study:	February 27, 2004
5. Completion of draft Pilot Report	March 15, 2004

C. The OWNER will be responsible for providing an enclosure for the pilot unit, source of power, raw water supply, use of on-site laboratory facilities, disposal of treated, backwash, and bleed water flows, disposal of spent cleaning chemical waste, and an operations staff member available approximately 4 hours per day to oversee the pilot unit.

CONTRACT

This Contract is made and entered into as of this ____ day of _____, 2001, by and between the SUNRISE WATER AUTHORITY, hereinafter called the "Authority" and , _____. hereinafter called the "Supplier".

THE PARTIES AGREE AS FOLLOWS:

1. **SCOPE OF WORK.** The Supplier shall perform all the work and furnish all the labor, materials, equipment (other than materials and equipment which the Contract Documents explicitly specify are to be provided by the Authority), tools and machinery, technical, professional and other services, transportation, incidentals and appurtenances required to complete the fabrication and delivery of a membrane filtration system more particularly described in the Contract Documents.

2. **TIME OF COMPLETION.** The Supplier shall begin work within five (5) calendar days after its receipt of the Notices to Proceed issued by the Authority and shall diligently prosecute all of the work to completion as specified in Section 5.2.1 of the Special Conditions. If the Supplier fails to complete the work within the time limits set forth herein, or as they may be modified as provided in the Contract Documents, liquidated damages shall be paid to the Authority, as provided in the Contract Documents.

3. **COMPENSATION.** Authority, as full consideration for the satisfactory performance by Supplier of the work to be performed, agrees to pay to Supplier compensation determined as specified in Section 5.10 "Measurement and Payment" of the Special Conditions, using the applicable prices contained in the Schedule of Quantities and Prices in Supplier's Proposal, PART 3.2. Compensation will be paid periodically as specified, subject to additions and/or deductions provided for elsewhere in the Contract Documents.

4. **COMPONENTS OF CONTRACT.** This Contract shall consist of, in addition to pages 1 through 2, the following documents each of which is attached hereto and all of which are hereby referred to and by this reference made a part hereof as fully and completely as if they were fully set forth herein:

PART 1	Notice to Vendors
PART 2	Instructions to Bidders
PART 3	Supplier's Proposal
PART 4	General Requirements
PART 5	Special Conditions
PART 6	Membrane System Specifications
PART 7	Membrane Filtration Validation Testing
PART 8	Addenda Nos. __ to __, inclusive

The Contract will also include Contract Change Orders, if any, issued by the Authority as provided in the Contract Documents. The Contract represents the entire integrated agreement between the parties hereto and supersedes prior negotiations, agreements or representations, whether written or oral, except representations contained in the Supplier's Information submitted together with the Proposal.

5. **WORKERS' COMPENSATION CERTIFICATION.** By its signature hereunder, the Supplier certifies that it is aware of the provisions of the Oregon Labor Code which require every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that Code, and agrees to comply with such provisions before commencing the performance of any of the Work in Oregon.

6. **NOTICES.** Any notices required or permitted under this Contract may be given by personal delivery to an authorized representative of the recipient or by certified or registered United States mail. In the case of the Supplier, notices shall be addressed to the business address specified in its Proposal. In the case of the Authority, notices shall be addressed to:

   Sunrise Water Authority
   10602 SE 129th Avenue
   Portland, OR 97236
   Attn: John Thomas, Project Manager

7. **GOVERNING LAW.** This Contract is executed and shall be performed in Clackamas County, Oregon. It shall be governed by and construed in accordance with the laws of the State of Oregon.

8. **LEGAL ACTIONS.** Any action relating to this Contract, including all disputes between the parties, shall be instituted and prosecuted in a court of competent jurisdiction in the State of Oregon.

IN WITNESS WHEREOF, the parties hereto have executed this Contract in duplicate originals, as of the day and year first above written, by their duly authorized representatives.

SUPPLIER:

U.S. Filter Wastewater Group, Inc.
Name Under Which Business is Conducted

By: _____

Name: Charles Bistline

Title: Senior Vice President / General Manager
President (or Vice President)

Attest: Diane Blamoke
~~Secretary (or Assistant Secretary)~~
Contract Coordinator

SUNRISE WATER AUTHORITY:

By: _____ 2/5/04
General Manager

Attest: _____ 2/5/04

PERFORMANCE BOND

KNOW ALL PERSONS BY THESE PRESENTS, that _____hereinafter called the PRINCIPAL , and _____, a corporation duly organized under the laws of the State of _____ having its principal place of business at _____

_____

in the State of _____, and admitted to transact business as a surety in the State of Oregon, hereinafter called the OBLIGEE, in the sum of _____ ($x,xxx,xxx) lawful money of the United States, for the payment of which, well and truly to be made, we bind ourselves, our heirs, executors, administrators and successors, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH THAT:

WHEREAS, the Principal has entered into a Contract with the OBLIGEE dated as of _____, 2003, for the construction of MEMBRANE FILTRATION SYSTEM, and said PRINCIPAL is required under the terms of said Contract to furnish a bond of faithful performance of said Contract.

NOW, THEREFORE, if the PRINCIPAL shall well and truly perform and fulfill all of the undertakings, covenants, terms and agreements of said Contract, (other than payment of Liquidated Damages, which is not covered by this Bond) and any modification thereto made as therein provided, at the time and in the manner therein specified, then this obligation shall become null and void, otherwise it shall be and remain in full force and effect.

The SURETY, for value received, hereby agrees that no change, extension of time, alteration or addition to the terms of the Contract, or to the work to be performed thereunder, or the Specifications incorporated therein shall impair or affect its obligations and its bond, and it hereby waives notice of any such change, extension of time, alteration or addition.

As a condition precedent to satisfactory completion of the Contract, the above obligations to the amount of _____ ($x,xxx,xxx) being not less that 50 percent (50%) of the total amount payable by OBLIGEE under the Contract, shall hold good for a period of one (1) year after completion and acceptance of the work, during which time, if the PRINCIPAL makes full, complete and satisfactory repair and replacement of defective materials, faulty workmanship, and work not conforming to the requirements of the Contract, and protects the OBLIGEE from cost and damage caused by the same, then the above obligation in the sum of _____ Dollars ($x,xxx,xxx) shall become null and void, otherwise it shall remain in full force and effect.

In the event suit is brought upon this Bond by the OBLIGEE and said OBLIGEE is the prevailing party, the SURETY shall pay, in addition to the sums set forth above, all costs incurred by the OBLIGEE in such suit, including reasonable attorney's fees to be fixed by the court.

IN WITNESS WHEREOF, the above bound parties have executed this instrument this ___ day of _____, 2003, the name and corporate seal of each corporate party being hereto affixed and these presents duly signed by its undersigned representative, pursuant to authority of its governing body.

_____

PRINCIPAL

By:_____

_____

SURETY

By:_____

Attorney-In-Fact

* * *

Note: Signature of person executing for SURETY must be notarized and evidence of corporate authority attached.

CHANGES TO THECONTRACT DOCUMENTS, AS A RESULT OF

1) ADDENDAS NO. 1 AND 2, AND

2) NEGOTIATIONS BETWEEN THE AUTHORITY AND VENDOR SUBSEQUENT TO THE BID OPENING DATE AND DOUCMENTED IN AMENDMENT NO. 1, AND THE ATTACHED LETTER FROM US FILTER DATED JANUARY 7, 2004;

HAVE BEEN INCOPRORATED INTO THESE DOCUMENTS. IN THE EVENT OF CONFLICTS BETWEEN THE ADDENDA AND AMENDMENT THE PROVISIONS OF THE ORIGINAL REQUEST FOR PROPOSALS SHALL PREVAIL. NOTE THAT US FILTER PROPOSAL NO. 03QC2132CMM AND THE UPDATE TO THIS PROPOSAL DATED 1/8/04 IS INCORPORATED INTO THIS CONTRACT BY REFERENCE ONLY.

MWH
MONTGOMERY WATSON HARZA

SUNRISE WATER AUTHORITY
NORTH CLACKAMAS COUNTY WATER COMMISSION WTP EXPANSION
Membrane Filtration System Procurement

ADDENDUM No. 1

October 31, 2003

A. Scope

Addendum No. 1 incorporates additions and changes to the Request for Proposals and Contract Documents for the Membrane Filtration System Procurement. Proposers shall acknowledge receipt of this Addendum as defined in Section 3.1 on page 11 of the Proposal Forms.

B. NOTICE INVITING PROPOSALS

1. The proposal due date is changed to **Friday, November 14, 2003** until **Noon PST**.

C. SECTION 1.0 PROJECT BACKGROUND

1. Modify the Project Schedule shown in Section 1.3 as follows (changes shown in ***bold italics***):

Issue Request for Proposals	October 13, 2003
Last Day for Questions by Proposers	***November 4***, 2003 at 4:00 pm PST
Last Day for Addendum Issued	***November 7***, 2003 by 4:00 pm PST
Proposals Due	***November 14***, 2003 by Noon PST
Interviews	***November 19***, 2003 (***morning***)
Issue Notice of Intent to Award to Supplier	***November 19***, 2003 (***no later than 4:30 pm***)
Workshop with Intended Supplier (Including Pilot Study Workshop)	***November 20***, 2003 (***4 to 6 hours starting in morning***)
Contract Negotiations complete	December 1, 2003
Issue Notice of Award	December 3, 2003
Issue Notice to Proceed	Upon Receipt of Performance Bond, insurance + up to 5 days
Pilot Plant Study and Reporting	December 8, 2003 through February 2004
Shop Drawing Submittal Process	December 8, 2003 through March 2004
Complete Set of Initial Submittals	no later than February 13, 2004
Shop Drawing Submittals Approved	no later than March 12, 2004
Equipment due On-Site (excluding membrane modules)	no later than October 6, 2004
Membrane modules due on-site	no later than February 2, 2005
Begin on-site construction	June 2004
Install Membrane Filtration Equipment	October 2004 through March 2005
Estimated Notice to Proceed with Membrane Filtration System Start-Up	March 22, 2005
Testing and Startup	March 22 to June 6, 2005
Plant operational	June 6, 2005

D. SECTION 2.0 INSTRUCTIONS TO PROPOSERS

1. Change the date until which questions will be accepted to November 4, 2003 at 4:00 pm PST.

MWH
MONTGOMERY WATSON HARZA

SUNRISE WATER AUTHORITY
NORTH CLACKAMAS COUNTY WATER COMMISSION WTP EXPANSION
Membrane Filtration System Procurement

ADDENDUM No. 2

November 6, 2003

A. **Scope**
Addendum No. 2 incorporates additions and changes to the Request for Proposals and Contract Documents for the Membrane Filtration System Procurement. Proposers shall acknowledge receipt of this Addendum as defined in Section 3.1 on page 11 of the Proposal Forms.

B. **SECTION 3.0 PROPOSAL FORMS AND SUPPLEMENTAL INFORMATION REQUIREMENTS**

1. In Section 3.1 Proposal Forms, subsection entitled "Liquidated Damages", second paragraph, change the number of days to satisfactorily complete the Commissioning Test to seventy six (76) calendar days to be consistent with the schedule requirements presented in Section 5.2.1.

2. In subsection 3.4.1.a "Minimum System Requirements", modify the following lines shown below:

   - Maximum Allowable Design flux equal to or less than 80% of the Supplier's California or Washington State certified value. If not certified in Washington or California, provide evidence of certified value from another state. (*2nd sentence added*)
   - Allowance for installation of 10% additional membrane surface area (*delete the word "capacity"*)
   - Minimum of 30 minutes between backwashing cycles (non-chemical backwashes) (*delete the words "retention time"*)

3. In subsection 3.4.1.a "Minimum System Requirements" in paragraph "Recycle Water", add the following line at the end:

   "- The waste flow from the membrane system to be diverted to a sludge lagoon or other on-site solids handling system will be treated with coagulant(s) to assist in solids settling and clarification prior to recycle. The selection and dosing of any additional chemicals other than coagulants added to the feedwater for solids settling will be made in cooperation with the Supplier to ensure that they are appropriate for use with the Supplier's membranes, and to assure a cost-effective treatment system. During times when coagulant is added to the membrane filtration system feedwater, it may not be necessary to add additional coagulants to the waste flow."

4. In Section 3.4.2 "Membrane System Operations and Maintenance Costs", a table is presented entitled "Membrane Skid Equipment Cost and Membrane Replacement Cost Variables". The word "skid" or the term "membrane skid" is shown in various places throughout the RFP and Contract Documents. In the context of this particular project, the term "membrane skid" should be considered equivalent to "membrane train" or "membrane tank".

5. In Section 3.4.2 "Membrane System Operations and Maintenance Costs", an equation is presented entitled "Annual Cost for Chemical Cleaning Labor and Disposal". Revise the equation as follows:

Annual Cost for Chemical Cleaning Labor and Disposal:

EE Annual Cleaning Cost = W * 4 * [($40/hour * 4 hrs) + (Z * $0.25/gal)]

= $

6. In subsection 3.7.1 "General Membrane Filtration System Data", paragraph E, replace the words "feedwater pumps" with "permeate pumps".

C. SECTION 4.0 GENERAL REQUIREMENTS

1. In Section 4.9 "Transfer of Title and Risk", end of second paragraph, modify the last part of the second sentence as follows:

"...as specified in Section 5.10.6, provided the equipment is in the Supplier's possession."

2. In Section 4.12 "Supplier-Furnished Drawings and Specifications", subsection 4.12.1 "General", replace the first sentence of the first paragraph as follows:

"The Authority shall have purchased the right to use the design supplied by the Supplier for use on this project."

3. In Section 4.14 "No Assignment", replace the entire paragraph as follows:

"Neither party shall assign this Agreement or any interest therein, or subcontract or delegate any duties hereunder without the prior written consent of the other party, except for subcontracts disclosed in the Supplier's Proposal."

D. SECTION 5.0 SPECIAL CONDITIONS

1. In Section 5.1 "Description of the Equipment and Work to be Done", subsection 5.1.2 "Work to be Done", it should be clarified that the Supplier is responsible for any off-site fabrication, manufacture and assembly of equipment required prior to shipment to the jobsite. The Installation Contractor will be required to assemble and install equipment delivered to the jobsite, per the Supplier's directions and instructions.

2. In Section 5.3 "Liquidated Damages", subsection 5.3.1 "Liquidated Damages for Late Completion", add the following sentence to the end of the second to last paragraph:

"Any delays resulting from incorrect installation shall result in an extension to the Commissioning Test period by at least an equal amount of time."

3. In Section 5.6 "Startup and Commissioning Test", subsection 5.6.2 "Commissioning Test Prerequisites", replace the second paragraph with the following:

"Prior to issuing the Owner's "Notice to Proceed with Membrane Filtration System Start-up", the Owner shall require written confirmation from the Supplier that the Supplier has completed the following Commissioning Test prerequisite items prior to start of the Commission Test period:"

4. In Section 5.6 "Startup and Commissioning Test", subsection 5.6.2 "Commissioning Test Prerequisites", add the words "to the best of the Supplier's knowledge" after the words "Confirm that" at the beginning of the third paragraph.

5. In Section 5.6 "Startup and Commissioning Test", subsection 5.6.2 "Commissioning Test Prerequisites", replace the fourth paragraph as follows:

   "Advise and oversee the installation of the membrane modules by the Installation Contractor."

6. In Section 5.6 "Startup and Commissioning Test", subsection 5.6.2 "Commissioning Test Prerequisites", modify the fifth paragraph to acknowledge that the Installation Contractor will flush the system and components under the supervision of the Supplier.

7. In Section 5.6 "Startup and Commissioning Test", subsection 5.6.2 "Commissioning Test Prerequisites", replace the seventh paragraph as follows:

   "Assist the Owner with operation and optimization of the Membrane Filtration System."

8. In Section 5.6 "Startup and Commissioning Test", subsection 5.6.3 "Commissioning Test Procedure", modify the beginning of the second sentence of the third paragraph as follows:

   "The Owner will then operate the plant including feedwater pumps….".

9. In Section 5.6 "Startup and Commissioning Test", subsection 5.6.5 "Termination of Commissioning Test", modify the end of the last paragraph as follows:

   "…, the cost will be paid for by the Supplier under conditions where the Supplier is responsible."

10. In Section 5.9 "Performance Warranties", paragraph 1 "Loss of Hollow-fiber Integrity", replace the two references to "Section 3.5.2, Line E" with "Section 3.4.2, Line E" contained within the main paragraph.

E. SECTION 6.0 MEMBRANE SYSTEM SPECIFICATIONS

1. In Section 2.01 "Membrane Filtration System Design Requirements", paragraph C, modify the following lines shown below:

   1. Maximum Allowable Design flux equal to or less than 80% of the Supplier's California or Washington State certified value. If not certified in Washington or California, provide evidence of certified value from another state. (*2nd sentence added*)
   2. Allowance for installation of 10% additional membrane surface area (*delete the word "capacity"*)
   3. Minimum of 30 minutes between backwashing cycles (non-chemical backwashes*) (delete the words "retention time"*)

2. In Section 2.01 "Membrane Filtration System Design Requirements", paragraph E, reference is made to the use of either alum or ACH as a coagulant during certain times of the year. The Owner is willing to consider use of other coagulants, such as PACl, if the Supplier demonstrates its effectiveness and will guarantee that the suggested coagulant is compatible with the proposed membrane filtration system. The Owner is planning to install two separate coagulant storage and feed systems to allow use of one or two coagulants depending on need and performance requirements.

3. In Section 2.01 "Membrane Filtration System Design Requirements", paragraph M, Line 1.f, indicates the use of membrane permeate with hardness less than 60 mg/L as calcium carbonate will be used for Chemical Cleanings. It is acknowledged that the Supplier has no control over the hardness content of the permeate. The Clackamas River water quality is generally described as a low alkalinity/low hardness surface water supply; the river's hardness content should always be less than 60 mg/L as calcium carbonate.

4. In Section 2.01 "Membrane Filtration System Design Requirements", paragraph M, Line 2.a indicates that the membrane filtration system components will be installed and operated in an unheated building. The proposed building to be constructed to enclose the membrane filtration system will, in fact, be heated, but only to provide freeze protection, at a temperature to be determined at a later date. The Owner still agrees to protect equipment and membrane modules delivered to the site to keep them from being exposed to temperatures of 32 degrees F (0 degrees C) or less.

5. In Section 2.02 "Schedule of Equipment", it should be noted that the Supplier shall furnish all chemical feed pumps and dosing equipment required for backwashing and cleaning the membranes. All pump motors and other drivers for all equipment provided by the Supplier shall include variable frequency drives as required for successful operation. The Owner shall furnish and install motor control center(s) (MCCs) for all 480v motors. Supplier shall provide control and contacts to automatically operate all of the furnished equipment, and other control/monitoring systems not being furnished by the Supplier, via its control panel(s).

6. In Section 2.02 "Schedule of Equipment", paragraph E, supply of piping is required for that which lays within the plan view area of the entire membrane filtration system tankage and near proximity for as complete a system as possible. Supplier shall provide the proposed piping layout and identify connection points. Small-diameter PVC or plastic piping for chemical feeds is not part of the piping supply scope of work, but the Supplier shall still provide the proposed piping layout and support requirements. Supplier shall clearly identify which piping is not proposed to be supplied.

7. In Section 2.02 "Schedule of Equipment", paragraph J, it is required that membrane unit support frames shall be constructed of 304SS. The requirement for the membrane support frame materials shall be non-corrosive per Section 6, paragraph 2.01.M and considering the usage and ambient environment. It will be required to provide 316 SS instead of 304 SS in locations where the pipe is exposed to high concentrations of chlorine (> 3 mg/L).

8. In Section 2.02 "Schedule of Equipment, paragraph K, reference is made to membrane skids and piping, fittings, valves, electrical and control conduits to be furnished. If the Supplier is providing loose-shipped equipment and there is no pre-fabricated or pre-assembled systems being provided, then there is no expectation that control conduits are to be provided.

9. In Section 2.02 "Schedule of Equipment", paragraph K, supply of piping is required for that which lays within the plan view area of the entire membrane filtration system tankage and near proximity for as complete a system as possible. Supplier shall provide the proposed piping layout and identify connection points.

10. In Section 2.02 "Schedule of Equipment, paragraph P, line b), omit the requirement for redundant power supplies.

11. In Section 2.02 "Schedule of Equipment, paragraph P, line d), modify the backup power requirement for the UPS within each control panel to provide 5 to 10 minutes of backup time.

12. In Section 2.02 "Schedule of Equipment, paragraph P, line f), modify the statement to read

    "Hardwire control contacts for all equipment provided by the Supplier and for other equipment required for a complete and operable system, but not supplied by the Supplier."

13. In Section 2.02 "Schedule of Equipment, paragraph Q, line d), the Wonderware graphic screens should be provided for the operator interface to be provided by the Supplier, and which can also be used for the plant's main control system workstation.

14. In Section 2.02 "Schedule of Equipment, paragraph Q, line f), modify the third line to indicate that wiring diagrams, and either loop diagrams or I/O schematic diagrams, are required.

15. In Section 2.02 "Schedule of Equipment, paragraph R, modify the last sentence as follows:

"The control panel shall accept a 480v, 3 phase, 60 Hz, 100 A circuit. 120v circuit is acceptable if 480v motor control is not provided by the panel."

MWH
MONTGOMERY WATSON HARZA

SUNRISE WATER AUTHORITY
NORTH CLACKAMAS COUNTY WATER COMMISSION WTP EXPANSION
Membrane Filtration System Procurement

Contract Amendment No. 1

January 30, 2004

This Amendment No. 1 shall be made part of the Contract between Sunrise Water Authority (SWA) and USFilter for the supply of membrane filtration equipment as described in USFilter Proposal # 03QC2132CMM.

1. **Modified Bid Form**

The revised pricing schedule based on modification to a five cell membrane facility design and additional requested items by SWA is shown in the attached letter provided by US Filter. The contents of the letter and the associated pricing supercedes the pricing shown in the Bid Form of the original proposal.

2. **Insurance**

US Filter will furnish to SWA copies of insurance certificates evidencing that it maintains the following coverages while performing services, subject to the terms and conditions of the policies:

TYPE	AMOUNT
Workers Compensation	Statutory
Employers' Liability	$1,000,000 policy limit
Commercial General Liability	not less than $1,000,000 per occurrence.
Automobile Liability	not less than $1,000,000 per occurrence

US Filter will furnish SWA with certificates of insurance verifying the above referenced coverages and stating that the insurance carrier will provide SWA with thirty days prior written notice of insurance cancellation or reduction below the above listed requirements. USFilter shall furnish an endorsement to the policies naming SWA and MWH Americas Inc. (MWH) as additional insureds for the commercial general liability (CGL) and the automobile liability insurance. US Filter's CGL and automobile liability shall be primary and non contributory to any policies carried by SWA or MWH and shall furnish a waiver of subrogation endorsement for all listed policies..

The attached insurance coverage, as modified by the above requirements, shall be included with the contract and serve as US Filter's coverages for the term of the Contract

3. **Manufacturing Tour**

A. USFilter shall provide to the SWA a facility tour of the Memcor R&D facility in Windsor, Australia. The tour shall include the General Manager of SWA, two water treatment operators, and two members of the SWA Board. Accompanying will be the SWA Project Manager, Product Specialist, and sales representatives for USFilter. This tour shall take place between March 15th

2004 and April 3rd, 2004, dependent on scheduling. The cost of this trip is included in the TMS Cost listed above.

B. A second tour shall take place in approximately April 2005, dependent on the actual construction schedule, and shall be considered part of the operator training included in the above TMS Cost. At this time, up to two membrane filtration plant operators will visit a similar Memcor installation that has been in operation for two years.

4. Membrane Chemical Cleaning Warrantee

Memcor warrants that only 8 chemicals cleaning will be required based on water quality and capacity needs listed in the contract documents. If more than the required chemicals cleaning are required, Memcor will perform a complete audit of the membrane process data and Memcor personnel will conduct any additional chemical cleanings on-site to determine if the cleaning regime is being followed.

Memcor personnel will also be present on-site for the fourth cleaning, which will take place approximately six months after start-up to ensure the proper procedure is being used and to answer any questions concerning the plant.

5. Membrane Performance Warranty

1) USFilter's Membrane Module Warranty period shall commence with successful completion and acceptance and continue until the end of the pro-rata warranty period submitted by USFilter on the Proposal Forms. The membrane module warranty shall consist of two parts, a full replacement warranty period, and a pro-rata warranty period.
   a) The full replacement warranty period shall last for a period of 12 months:
      i) The OWNER shall record and maintain records of the date of installation for membrane modules.
   b) The pro-rata warranty period shall commence with the end of the full replacement period and last until the end of the pro-rata warranty period as submitted by USFilter.
   c) USFilter warrants that the membrane modules will be free from non-conformance in:
      i) materials
      ii) workmanship
      iii) membrane integrity failure
      iv) irreversible flux loss
   d) After final acceptance, if the membrane modules are determined to be non-conforming with respect to membrane integrity, USFilter will remedy in accordance with the AGREEMENT.
      i) Non-conforming membrane modules may be returned to service under the conditions outlined in Definition of Membrane Integrity Failure below.
      ii) If within 60 days after the notification to USFilter it has become apparent to the OWNER membrane modules are not able to meet the provisions of the warranty, the OWNER will provide USFilter with a breach of warranty claim.
   e) Limitation of Membrane Module Warranty: OWNER recognizes that the occurrence of any of the following shall void the membrane module warranty.
      i) Physical damage or faulty installation of the membrane modules by others,
      ii) Unauthorized alteration of components manufactured by USFilter,
      iii) Catastrophic exposure to chemicals not normally associated with water treatment as a result of accidents, vandalism or other acts that are totally outside the bounds of routine and normal water treatment plant operations,
      iv) Use of water treatment chemicals, chemical cleaning solutions or cleaning procedures other than chemicals, solutions and procedures approved by USFilter. The OWNER shall notify USFilter of any change of pretreatment chemicals prior to the membrane modules.
      v) Exposure of the membranes to water treatment or treatment chemicals at concentrations above levels or contact times acceptable to USFilter. USFilter is responsible to provide to the

OWNER a listing of the known water treatment and cleaning chemicals and concentrations and time of exposure that could result in a loss of membrane integrity or cause irreversible fouling as part of the Submittal. Operation or cleaning of the membrane outside the stated limits shall void the remaining portion of the membrane module warranty.

vi) Improper maintenance of equipment, as defined in the O&M Manual.

vii) Failure of the OWNER to maintain electronic operational logs as required by USFilter. The maintenance of electronic logs is subject to the following conditions:

(1) USFilter is responsible to provide to the OWNER a listing of the operational data points that are to be electronically logged

(2) USFilter is responsible for the control programming of data points that are to be electronically logged

(3) USFilter shall identify minimum frequencies of logging of all operational data points required by USFilter to maintain membrane module warranty provisions

(4) USFilter shall establish the alarm and shutdown limits that would result in the operation of the equipment outside acceptable limits

viii) In the event of a warranty claim, failure of the OWNER to provide USFilter with electronically and written logs.

f) Changes in USFilter established operational and maintenance guidelines cannot be applied retroactively to invalidate the membrane module warranty.

g) USFilter is solely responsible for the identification of water quality parameters, instrumentation and control programming required to satisfy and maintain membrane module warranty provisions for operation and cleaning. For example, if the membrane has a tolerance for pH, temperature or chlorine, instrumentation and control logic will be provided to maintain the provisions of the warranty. USFilter shall establish the instrumentation alarm and shutdown limits to prevent operation of the equipment outside of established limits.

2) OWNER recognizes that to satisfy warranty requirements, USFilter may provide membrane replacement modules that embody changes in module design and construction features. OWNER recognizes that the replacement of membrane modules pursuant to this warranty with a different membrane module is acceptable under the following conditions:

a) That the specified design and operational parameters (e.g. design flows, water quality, system recovery and chemical cleaning intervals) are obtained.

b) That the change in membrane modules will not represent an increase in the operational cost to the OWNER.

c) The revised module must be in compliance with regulatory requirements.

3) Definition of Membrane Integrity Failure: Membrane modules shall be considered to have non-conforming integrity failure under the following conditions:

a) If for a membrane unit:

i) The maximum number of Membrane Integrity Failure Occurrences is greater than 6 in any 3 month duration or greater than 12 in any 12 month duration.

ii) Integrity testing shall be performed periodically, approximately once every day on each unit. If a Membrane Integrity Failure Occurrence is identified, the individual modules shall be pin repaired, or replaced if pin repair is not possible, and the unit will be retested and returned to service. The membrane module serial number and number of membrane fibers repaired shall be recorded. The Membrane Integrity Failure Occurrence shall be documented by the OWNER.

iii) A Membrane Integrity Failure Occurrence for a single module is defined as a loss of integrity (e.g. partial or complete fiber breaks) that results in less than 3.5-log (or 99.95 percent filtration efficiency at or below a removal of 3 microns) (NOTE: The full system will maintain integrity above 4-log at all times) as determined by an air pressure based Direct Integrity Test such as the:

(1) Pressure Decay Test

(2) Diffusive Airflow Test

(3) Correlated Airflow Measurement Test

(4) Other conforming integrity tests that satisfy the criteria for test resolution and sensitivity as described by any recognized independent method developed by a consortium of membrane module manufacturers, or described and accepted as a method by the primacy agency.

iv) The log reduction value (LRV) shall be determined by the maximum design flux and maximum TMP if calculated using the test result on an intermittent basis.

v) The LRV shall be determined by the operating flux and TMP if calculated on a continuous basis using the result of the last direct integrity test.

vi) If a membrane unit exceeds the maximum amount of Membrane Integrity Failure Occurrences, the OWNER will have the option of requiring the replacement of all membrane modules within the membrane unit - unless either:

(1) USFilter can demonstrate through lot traceability that the Membrane Integrity Failure Occurrence is attributed to a specific lot of membrane modules within a previously defined range of consecutive serial numbers. The lot size shall be established by the membrane module manufacturer, but shall not be less than 25 modules; or

(2) The number of membrane modules that are accountable for the Membrane Integrity Failure Occurrences are "localized" to less than 10 percent of the membrane modules located on the membrane unit

vii) The provisions for complete unit module replacement in Paragraph 6), shall not apply if more than 10 percent of the membrane modules located on the unit have required replacement under the criteria established for individual membrane modules or partial membrane replacement.

viii) If it is demonstrated that the membrane integrity failure defect is attributed to a specific lot or localized, then all membrane modules that have had more than a single previous occurrences of pin repair, shall be replaced, even though they may be located in another membrane unit or may not have exceeded the criteria for individual membrane module integrity failure

ix) If more than 2 membrane units require complete replacement due to failure within any 12-month period, the OWNER shall retain the option to require the replacement of all remaining membrane modules.

b) Individual membrane module(s) shall be considered to have integrity failure under the following conditions:

i) If for a single membrane module, more than 50 of the fibers (~0.5%) have required repair by pinning in any 12 consecutive months or if more than 100 have required repairs over the life of the membrane module, then the module shall be considered defective. An individual membrane fiber shall be defined as requiring repair if it visually leaks during an air pressure integrity test at the integrity test pressure.

ii) If a module assembly fails the air pressure integrity test and cannot be repaired by pinning or gluing then the module is considered defective.

4) Irreversible Flux Loss.

a) Membrane modules shall be considered to have non-conforming irreversible flux loss under the following conditions.

i) Definition of "clean water" resistance: The temperature corrected membrane resistance is defined as the 'clean water' membrane resistance, taken at a minimum of 1 hour after start up of the membrane unit after completion of the chemical cleaning process, and taken 5 minutes after the completion of the most recent backwash. The Temperature correction shall be calculated at 20 degrees C using a viscosity correction factor. The equations and units used to calculate resistance are as follows:

$$R = \frac{\Delta P}{J\mu}$$

Where: R = Membrane Resistance (psid/gfd-cp)
J = Membrane Flux (gfd)

μ = viscosity of water (cp)
ΔP = Differential Pressure (Psi)

ii) Definition of Irreversible Flux Loss: Irreversible Flux loss will be stated to have occurred if the membrane fails to obtain chemical cleaning intervals as defined in USFilter contract document in any of three successive runs when operated at or below the maximum membrane design flux using backwash and chemical washing frequencies established for the particular system on a feedwater quality identified in USFilter contract document.

b) OWNER recognizes that to remedy warranty provisions for irreversible flux loss, USFilter may modify operational protocols and recognizes that any change to the operational protocols must be acceptable to the OWNER. OWNER recognizes that the changes to operational protocols by USFilter pursuant to this warranty provision is acceptable under the following conditions:
   i) That the specified design parameters (e.g. production capacity, water quality, system recovery and chemical cleaning interval) are obtained.
   That the change in operational parameters and protocols (e.g. backwash, chemical washing or chemical cleaning) will not represent an increase in the operational or membrane replacement cost to the OWNER.

8. All dates included in the Request for Proposals (RFP) shall be considered as number of days after the Notice to Proceed (NTP) stated in the RFP. Revised dates shall be developed that reflect the same number of days after NTP once the actual NTP is issued.

9. Section 5.10.2 Membrane Filtration System shall be modified as follows:

   Progress estimates will be made in accordance with the following schedule:

   Fabrication Drawings Satisfactorily Complete 2%
   Fabrication of Membrane Skids and Skid Mounted Components 33%

   The remainder of the progress payment schedule remains unchanged.

ACORD CERTIFICATE OF LIABILITY INSURANCE

DATE 03/03/2003

PRODUCER 877-945-7378

Willis North America, Inc. - Regional Cert Center
26 Century Blvd.
P. O. Box 305191
Nashville, TN 372305191

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW.

INSURED
USFilter Corporation
40-004 Cook Street
Palm Desert, CA 92211

INSURERS AFFORDING COVERAGE

INSURER A: Zurich American Insurance Company of Illi 27855-005
INSURER B: Zurich American Insurance Company 16535-004
INSURER C: American Guarantee & Liability Insurance 26247-004
INSURER D:
INSURER E:

COVERAGES

THE POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS AND CONDITIONS OF SUCH POLICIES. AGGREGATE LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

INSR LTR	TYPE OF INSURANCE	POLICY NUMBER	POLICY EFFECTIVE DATE (MM/DD/YY)	POLICY EXPIRATION DATE (MM/DD/YY)	LIMITS	
A	GENERAL LIABILITY	GL0293887700	3/1/2003	3/1/2004	EACH OCCURRENCE	$ 1,000,000
	X COMMERCIAL GENERAL LIABILITY				FIRE DAMAGE (Any one fire)	$ 1,000,000
	CLAIMS MADE X OCCUR				MED EXP (Any one person)	$
	X $2,000,000 SIR				PERSONAL & ADV INJURY	$ 1,000,000
	X Pol Limits Excess SIR				GENERAL AGGREGATE	$ 5,000,000
	GEN'L AGGREGATE LIMIT APPLIES PER:				PRODUCTS - COMP/OP AGG	$ 5,000,000
	POLICY PRO-JECT LOC					
B	AUTOMOBILE LIABILITY	BAP293887900	3/1/2003	3/1/2004	COMBINED SINGLE LIMIT (Ea accident)	$ 2,000,000
A	X ANY AUTO	TAP293888100	3/1/2003	3/1/2004		
A	ALL OWNED AUTOS	BAP293888000	3/1/2003	3/1/2004	BODILY INJURY (Per person)	$
	SCHEDULED AUTOS					
	HIRED AUTOS				BODILY INJURY (Per accident)	$
	NON-OWNED AUTOS					
	X Hired Autos				PROPERTY DAMAGE (Per accident)	$
	X Non-Owned Autos					
	GARAGE LIABILITY				AUTO ONLY - EA ACCIDENT	$
	ANY AUTO				OTHER THAN AUTO ONLY: EA ACC	$
					AGG	$
C	EXCESS LIABILITY	AUC9309501	3/1/2003	3/1/2004	EACH OCCURRENCE	$ 5,000,000
	X OCCUR CLAIMS MADE				AGGREGATE	$ 5,000,000
						$
	DEDUCTIBLE					$
	RETENTION $					$
A	WORKERS COMPENSATION AND EMPLOYERS' LIABILITY	WC293887600	3/1/2003	3/1/2004	X WC STATU-TORY LIMITS OTH-ER	
A		WC293887500	3/1/2003	3/1/2004	E.L. EACH ACCIDENT	$ 1,000,000
					E.L. DISEASE - EA EMPLOYEE	$ 1,000,000
					E.L. DISEASE - POLICY LIMIT	$ 1,000,000
	OTHER					

DESCRIPTION OF OPERATIONS/LOCATIONS/VEHICLES/EXCLUSIONS ADDED BY ENDORSEMENT/SPECIAL PROVISIONS

General Liability Includes Contractual Liability.

CERTIFICATE HOLDER | ADDITIONAL INSURED; INSURER LETTER: | CANCELLATION

To Whom It May Concern

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, THE ISSUING INSURER WILL ENDEAVOR TO MAIL 30 DAYS WRITTEN NOTICE TO THE CERTIFICATE HOLDER NAMED TO THE LEFT, BUT FAILURE TO DO SO SHALL IMPOSE NO OBLIGATION OR LIABILITY OF ANY KIND UPON THE INSURER, ITS AGENTS OR REPRESENTATIVES.

AUTHORIZED REPRESENTATIVE

David M Liner

IMPORTANT

If the certificate holder is an ADDITIONAL INSURED, the policy(ies) must be endorsed. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

If SUBROGATION IS WAIVED, subject to the terms and conditions of the policy, certain policies may require an endorsement. A statement on this certificate does not confer rights to the certificate holder in lieu of such endorsement(s).

DISCLAIMER

The Certificate of Insurance on the reverse side of this form does not constitute a contract between the issuing insurer(s), authorized representative or producer, and the certificate holder, nor does it affirmatively or negatively amend, extend or alter the coverage afforded by the policies listed thereon.

USFilter

1728 Paonia Street
Colorado Springs, CO 80915

TELEPHONE 719-622-5322
FACSIMILE 719-597-3782

January 7, 2004

Kathryn Mallon, P.E.
Project Manager
MWH
111 S.W. 5th Avenue
Portland, OR 97204-3604

Re: Sunrise Water Authority WTP Expansion

Dear Kathryn,

In response to your letter dated December 18, 2004, we are pleased to offer the following information:

1. Per your request USFilter Memcor has amended our initial proposal for the above referenced project from a six cell design (15 MGD) to a five cell design. Attached you will find drawings showing the five cell design (5X384S10V) to handle the ultimate capacity of 15 MGD and cut sheets for the re-sized equipment. You will note that only the pumps have been changed. The remaining ancillary equipment will remain as proposed in our initial submittal. Each cell will contain 12 racks.

   For the initial 10 MGD, four cells will be used with twelve racks installed. Nine racks will be furnished complete with 32 modules per rack. The remaining three racks will contain expansion spacers designed to hold the same volume in the cell as modules. Pricing for this option layout will include all ancillaries to handle the five cell design, as requested. A separate cost will be provided for the 5 MGD expansion and will include 12 racks, the required modules for an additional 5 MGD and clovers.

2. As requested, both a MemSAP and Rack Inserts have been added to the amended price.

3. Hach particle counters will be used instead of MetOne particle counters

4. The cost to replace the two 30-inch E&H ultrasonic flow meters with 30-inch Krohne magnetic meters will be $19,000. This pricing will be added to the final price if requested by MWH and Sunrise Water Authority.

5. Hach model 1720E turbidimeters will be provided instead of model 1720D.

6. The pricing for the 10 MGD option, with ancillaries for 15 MGD will remain in effect for 30 days after the receipt of this letter. The additional 5 MGD expansion will remain in effect for one year after the initial contract is signed between USFilter Memcor and Sunrise Water Authority.

7. USFilter is willing to accommodate two additional Board Members on the trip to our manufacturing facility, for a total of five personnel. Due to the delay in contract signing and the initial shop drawings submittal schedule, we propose March 15 through March 20th or March 29th through April 3rd as tentative dates.

8. Section 3 of the proposal is attached to this transmittal, starting at Section 3.5. The following price schedule shall be used instead of the initial Section 3.0. The pricing below shall supercede all other pricing submitted.

VEOLIA Environment

USFilter

1728 Paonia Street
Colorado Springs, CO 80915

TELEPHONE 719-622-5322
FACSIMILE 719-597-3782

A. Complete Memcor CMF-S microfiltration system including all pumps, compressors, blowers, backwashing equipment, and chemical clean-in-place equipment for 15 MGD. Membrane modules (4X288), clovers, and racks (48 in total) to be supplied for 10 MGD.	$ 2,560,173
B. Membrane Service Access Platform (MemSAP)	$24,913
C. Rack Inserts, designed to increase recovery by reducing void space	$41,914
D. Shipping of complete system, FOB, Oregon City, OR	$ 48,000
E. Technical services during design, installation, testing/start and commissioning services, 11-month warranty inspection services and training.	$ 59,000
F. Pilot Plant Validation Study, including mobilization/demobilization, equipment, materials, consumables, on-site services, and reporting	$ 15,000
Initial Membrane System Cost	***$2,749,000***
G. cost to replace the two 30-inch E&H ultrasonic flow meters with 30-inch Krohne magnetic meters	$19,000
H. Cost (in addition to cost of item A above) for an additional 5 MGD of capacity including 12 racks, modules, clovers	$713,000
I. Extended Storage of Membrane Filtration System ($per month up to six months)	$1,800.00

If you have any questions about the information above, please feel free to contact me at 719-550-2228.

Sincerely,

USFilter

Lisa Sorgini
Memcor Product Specialist

cc: Steve Reilly - WHR
Hollie Scott - USFilter
Tom Muilenberg – USFilter

VEOLIA Environment